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EFFICIENCY OF SMALL SCALE INDUSTRIAL UNITS IN WEST BENGAL: AN EMPIRICAL ANALYSIS *

Sharmistha Banerjee **

Abstract : The small scale industrial units are found to survive in the most technologically advanced countries of the world. It not only survives but also accounts for a considerable share of total manufacturing output and employment of the economy. In a capitalistic market economy if a particular sector survives, it must have competitive efficiency to fight the battle of competition. This paper attempts to understand the factors that might explain the variation in efficiency within the small enterprises sector. It is an empirical work that analyses the reality to the extent it is reflected in a given set of data on 200 small scale units of West Bengal, obtained from a National Survey of Small Scale Industries conducted by Indian Institute of Management (Ahmedabad) in 1995-96. That is why, the study should not be considered as anything beyond a case study. The said survey did collect information on the output in the form of value of turnover (at current prices) but nothing in the area of cost of production was available, which would enable a rational study on efficiency. However, there had been another important parameter – the information on the percentage of installed capacity utilised by a firm. We decided to utilise this information as a proxy to the level of efficiency of a firm because there is a relationship between cost, productive efficiency and level of installed capacity utilised by a firm. Under the assumption of either a constant return to a factor and / or better management of inventory and marketing devices, the index of capacity utilisation (or the percentage of installed capacity utilisation) can serve as a good proxy to the efficiency of a firm. The factors that explain the variation in efficiency may as well be captured in terms of a discussion that considers capacity utilisation as a proxy to efficiency. In this discussion, a clue is taken from such theoretical understanding and an econometric model is run, with the help of binary logistic regression in which the index of the level of capacity utilisation is taken as the explained variable; the explanatory variables being such factors as the location of the unit, present turnover, form of ownership, family background of the entrepreneur, nature of activity, market characteristics, whether engaged in advertising activity, if yes, advertisement budget, turnover prior to 1991-92, growth in the market of the firm since 1991-92, sources of competition and margin on sales.

This model considers the scenario of a typical Indian firm (capacity utilisation being equal to or less than 50 percent of installed capacity), counterpoised to the firms which are better placed in terms of capacity utilisation (using greater than 50 percent of installed capacity). The question that this model tries to answer is, what are the factors that would contribute to a firm's movement from mediocrity to excellence. In other words, the regression attempts to indicate factors that would lead to better utilisation of installed capacity, which *inter alia*, would lead to cost efficiency by way of reduction in overheads and decrease in idle capacity.

Key Words : Efficiency, Capacity Utilisation, Survey, Productivity, Proxy to efficiency, Location of unit, Form of ownership, Nature of activity, Market characteristics, Advertisement budget of the unit, Effect of liberalisation on the unit.

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Dennis Anderson (*Small Industry in Developing Countries: A Discussion of Issues, World Development,* 1982) has pointed out that, with industrialisation there is a secular decline in the share of the household and artisan sector of the economy, which faces the reality of near extinction in the advanced countries of the world. Summarising the historical experience, he observes that the process of industrialisation moves through three distinct phases. In the early phase of industrialisation, which he denotes as Phase I, there exists a powerful household and artisan sector that accounts for the employment of a sizeable section of the workforce. But the importance of this sector declines over time and small industries along with large industries go on increasing. In fact, both these sectors increase their share in the economy at an increasing rate. In Phase II, the household and the artisan sector faces a decline. The gap is met by the small and the large sector. However, while the share of the small now increases at a decreasing rate, the share of the large sector still increases at an increasing rate. In Phase III, which is described as the stage of industrialisation of the present day economies of USA and Japan, the artisan and the household sector faces near extinction but the declining trend is not observed in case of small firms. The small survives and reaches a plateau from which it is never dislodged. Anderson, however noted that some small firms expand into large scale firms, but some others remain small and survive by creating marketing or production niches.

The evidences collected from various countries of the world also do not support the hypothesis that, like the household and artisan sector, the small industries face near extinction in the advanced stages of industrialisation. On the contrary, it survives and accounts for a considerable share of total manufacturing output and employment of the economy, even in the advanced countries of the world.

In a capitalistic market economy if a particular sector survives, it must have competitive efficiency to fight the battle of competition. *What explains this efficiency?* A small scale unit does not enjoy the economies of scale – the major advantage that a large scale unit enjoys. Seldom does it get the advantages of technological innovations – innovations usually help the large scale sector. More often than not, the state policies are found to remain tilted in favour of the big industries which can exercise powerful influence in the organs of the state for shaping the policies in their favour. Even then the small survives. It survives, not due to the protectionist policy of the state - the state hardly protects a sector unless there is political compulsion. Even when there is protectionist policy it favours a tiny segment of the small sector, the majority of the units of the small sector survives even when there is no protection or when the economy opens up and the sector faces competition from the outside world.

The efficiency of the small sector is therefore, an issue that attracts many a researcher on the subject. There is a vast literature on the survival and growth of small enterprises. The consensus seems to be that there exists multiple factors explaining the efficiency and therefore the survival of small, some of which are specific to a type of industry, type of region or the specificity of the industrial milieu in which the concerned unit operates. Some of the explanatory factors are economic, some are sociopolitical in nature.

What explains the variation in efficiency within the small scale sector ? A model was developed by Gimeno, Folta, Cooper and Woo (Administrative Science Quaterly, 1997) explaining why some firms survive while others with equal economic performance do not. They opine that organistaional survival depends on the firm's own threshold of performance. This is determined by the entrepreneur's human capital characteristics, such as alternative employment opportunities, income from entrepreneurship and cost of switching to other occupations. Using a sample of 1547 entrepreneurs of new businesses in USA, the study suggests that firms with low thresholds may choose to continue or survive despite comparatively low performance.

This study attempts to understand the factors that might explain the variation in efficiency within the small enterprises sector. Mostly, it is an empirical work that analyses the reality to the extent it is reflected in a given set of data obtained from a National Survey of Small Scale Industries conducted by Professor S. Morris of Indian Institute of Management (Ahmedabad) in 1995-96 and the West Bengal section was supervised by Professor R. Khasnabis of Department of Business Management, Calcutta University. It was based on 200 small scale units in selected districts of West Bengal. That is why, the study should not be considered as anything beyond a case study. In other words, the study is confined to the reality of the small scale sector to the extent the data set captures the Indian scenario. The information on necessary socioeconomic variables that might explain the variation in efficiency was not available from the officially published data of the Small Industries Development Organisation (SIDO) or the National Sample Survey Organisation (NSSO). But the causal factors that might explain the variation in efficiency of the small scale sector - the central issue of this paper had to be addressed on the basis of a data set, which was smaller than the coverage of the SIDO or the NSSO.

The survey gathered information about different economic, sociological and technological aspects of the small units, namely, the locale, the nature of business and ownership, motivation behind starting a small unit, the kind of market in which the small business operates, the volume of turnover, profit margin, level of capacity utilisation, the sources of competition for the small firms, the scenario after the introduction of the new economic policy and the ways and means by which they survive in the world ruled by the 'big'.

The data set mentioned has been utilised for getting some stylised information on the sources of variation in cost efficiency within the small sector. In order to make best use of the data set, a proxy for cost efficiency had to be set. As one knows, it is difficult, if not impossible to get the information on the various elements of cost of any small scale industrial unit. In the first place, such data are not maintained properly in the business records of small units. Again, even if the entrepreneur has an understanding about the various elements of cost that he incurs, it is least likely that he will divulge such information to an outsider even for the sake of a survey, unless he is compelled to do so. The information that one may collect after putting much labour on it may yield results, which could turn out to be shaky.

Neither the SIDO nor the NSSO, not even this Survey that the Government of India sponsored, collect information on cost in a way the standard accounting practices would advice (the information which would be otherwise available from the Profit and Loss Account and Balance Sheet of incorporated bodies). The said survey did collect information on the output in the form of value of turnover (at current prices) but nothing in the area of cost of production was available from the results of the field survey. However, there had been another important parameter – the information on the percentage of installed capacity utilised by a firm. We decided to utilise this information as a proxy to the level of efficiency of a firm because there is a relationship between cost, productive efficiency and level of installed capacity utilised by a firm.

As more and more of the installed capacity is used the fixed cost per unit of production is reduced. Variable cost following the Law of Variable Proportions, total cost and hence average cost declines and reaches an optimum, which is the level of optimum efficiency of a firm. Further, enhancement of the level of utilisation of installed capacity will increase the average cost if the Law of Variable Proportions operates. In real life however, it is often observed that a unit finds it advantageous to go on utilising the installed capacity without taking care of the situation as regards its impact on the variable component of the cost because the negative effect of variable cost is more than compensated by utilising the favourable market conditions and better management of inventory. (Sen, Micro Economics, 1989). Ordinarily therefore, under the assumption of either a constant return to a factor and / or better management of inventory and marketing devices, the index of capacity utilisation (or the percentage of installed capacity utilisation) can serve as a good proxy to the efficiency of a firm.

Instead of seeking an explanation on cost efficiency one may reset the issue and attempt to address it in terms of another attribute that has correspondence to cost efficiency and information on which might be more readily available. Technically, this is called the use of a proxy variable.[i] (Stundermund, A. H. and Carsidy, Henry J, 1987). For this exercise capacity utilisation (percentage of installed capacity utilised) has been considered as the proxy to the measure of efficiency of a firm. There are reasons to believe that the quality of information pertaining to this proxy variable would be better.

Efficiency is related to the level of utilisation of capacity. The factors that explain the variation in efficiency may as well be captured in terms of a discussion that considers capacity utilisation as a proxy to efficiency. In this discussion, a clue is taken from such theoretical understanding and an econometric model is run, in which the index of the level of *capacity utilisation* is taken as the explained variable; the explanatory variables being such factors as the *location of the unit, present turnover, form of ownership, family background of the entrepreneur, nature of activity, market characteristics, whether engaged in advertising activity, if yes, advertisement budget, turnover prior to 1991-92, growth in the market of the firm since 1991-92, sources of competition and margin on sales.*

The present work is different from what one gets from the ordinary regression analysis in which the contribution of each explanatory factor is captured in terms of the estimated values of the regression coefficient and the overall power of the model is described in terms of the value of multiple regression (R square). Such models are deterministic in nature. The underlying idea is that the social scientist cannot predict with quantitative precision the contribution of a factor in explaining a social or economic phenomenon. Nowadays, however, the social scientists have better quantitative tools, thanks to the research in regression analysis, with which a social scientist can consider a probabilistic situation. The deterministic models can be supplemented or replaced with such models. The improvement that one may claim out of such an exercise is that, the scientist is not now compelled to predict with quantitative precision, the contribution of a particular factor in explaining a social or economic phenomenon. On the other hand, one may, with the help of these new tools, explain the probability of reaching an alternative scenario, compared to a given situation, with inclusion or exclusion of a particular variable in the model. The impact of the variable in changing the probability can also be assessed.

Therefore, a new tool was put to use in the framework of a binary logistic regression. It was perceived that, instead of developing a deterministic empirical exercise the reality could be understood in a better way, if the issue was reset. So an attempt was made to discover the probability of reaching a better or worse scenario with respect to capacity utilisation, as a particular explanatory factor becomes operative in a milieu of the small units. For this, capacity utilisation, the proxy variable was taken as a categorical variable – the firms were categorised according to the different levels of capacity utilisation. The problems of moving from a worse scenario to a better one in terms of capacity utilisation associated with various explanatory factors have been studied. Finally, an attempt is made to theorise the phenomenon of intra industry variation in efficiency within the small sector in terms of a select set of explanatory variables.

The Model

The hypothesis is that the level of capacity utilisation of a firm depends on the set of variables listed above. In other words, the model suggests that a firm is more productive if it is located in a certain kind of locality; a particular kind of activity makes the firm more profit worthy; a certain kind of market is more favourable to the performance of the small business and a particular family background of entrepreneur help the firm attain efficiency. Efficiency is also explained by the kind of competition faced by the small unit. The model includes twelve such variables altogether in its set of explanatory variables. The extent to which such factors contribute to the observed variation in the level of capacity utilisation of the firms, is proposed to be tested by a regression model. Ordinarily, with the capacity utilisation (C_u) as the explained qualitative variable, the regression model assumes a functional relation that can be expressed in unspecified form as follows :

$C_u = f\,[\,L_u, T_o, F_o, F_b, N_a, M_c, A_y, A_b, T_{pl}, S_c, G_{pl}, M_s\,]$-----(1) Where, L_u, T_o, F_o, F_b, N_a, M_c, A_y, A_b, T_{pl}, S_c, G_{pl}, M_s stand for the different independent variables, namely,

L_u = Location of the unit, T_o = Turnover, F_o = Form of Ownership,

F_b = Family background of the entrepreneur, N_a = Nature of activity,

M_c = Market characteristics, A_y = Advertisement activity, A_b = Advertisement budget,

T_{pl} = Difference between present turnover and turnover in 1991-92,

S_c = Sources of competition faced by the firms,

G_{pl} = Growth in the market since 1991-92 according to the entrepreneur and

M_s = Margin on sales.

A linear regression with twelve explanatory variables might then be suggested. Mathematically the regression equation is represented as :

$$C_u = \beta_0 + \beta_1 L_u + \beta_2 T_o + \beta_3 F_o + \beta_4 F_b + \beta_5 N_a + \beta_6 M_c + \beta_7 A_y + \beta_8 A_b + \beta_9 T_{pl} + \beta_{10} S_c + \beta_{11} G_{pl} + \beta_{12} M_s \text{ ----------------------- } (2)$$

The regression would estimate the beta coefficient (which would include β_0 as the intercept term of the regression model).

There are however practical problems in running this linear regression. Many of the variables are qualitative in nature. When a qualitative variable appears in the set of explanatory variables, one may take recourse to the introduction of categorical explanatory variables in the form of dummy variables. In this case however, it will not solve the problem because the explained variable, capacity utilisation (C_u), is also a categorical variable. Although percentage is a quantitative variable, in this case the percentage comes not exactly as a specific quantitative value but a range of values, such as less than 30 per cent, within the range of 30 to 50 per cent and so on. The practitioner has no alternative but to turn the explained variable into a categorical variable – a category representing a range of percentage of capacity utilised. Consequently, the regression model has to be reset in terms of a model that includes categories as explained variables. As one knows, such a problem is usually tackled by the practitioners by introducing a logistic regression which is not a simple linear regression as indicated in (2). It assumes a log linear relationship involving all the explanatory variables – qualitative as well as quantitative.

As the model is reset in terms of a logistic regression, it becomes more powerful than an ordinary linear regression in addressing the problem that the present study attempts to tackle. As in case of linear regression, the logistic regression would of course test whether the set of independent variables jointly explains a reasonable *percentage in variation of capacity utilisation* within the select group of small firms. This may be assessed by considering the R Square which would estimate the joint effect of each of the explanatory variables on the explained variable. However with the available data set, there is another way of explaining interrelation among the variables that might be explored and that might explain the variation in efficiency (proxied by the percentage of capacity utilisation) in a more meaningful way. (Cox and Snell's and Nagelkerke's R Square approximates what one would get in case of linear regression. A logistic regression would also estimate the effectivity of each. Nagelkerke, N.J.D.; 1991).

This possibility is explored by the coefficients of the estimated logistic regression and in this way, the logistic regression adds more power to the regression analysis. It would explain the probability of 'better or worse performance' of a firm, in terms of the explained variable (capacity utilisation in this case) as a particular explanatory variable becomes operative. To explain this point a tentative example is used. *Form of ownership* is an explanatory variable in this case. The ordinary regression would estimate the regression coefficient of this variable. It would describe the percentage change in explained variable as a result of a change in the explanatory variable. When the explanatory variable is qualitative, as in case of the form of ownership the ordinary regression would describe this in terms of a dummy variable (what percentage change will result out of a movement from one category to another). The model that is proposed would test whether the change of a particular form of ownership (say from proprietorship to partnership) could contribute to enhancement (or deterioration) in the extent of capacity utilised by a firm so that the firm would (or would not) move from one category to the other. The measure is probabilistic. The intensity of this probable effect of such a change in the explanatory variable can be assessed by the value of the corresponding regression coefficient.

The Variables

The Dependent Variable

In this case, the dependent variable is capacity utilisation. Capacity utilisation is taken as a percentage of the installed capacity. The relevant data was collected by running a questionnaire, in which the respondent was supposed to provide information on current level of capacity utilisation. It was a multiple choice close ended question in which the respondents were provided a set of options, namely, C_{u1} = utilisation of less than 30 per cent of installed capacity; C_{u2} = utilisation of 30 percent to 50 percent of installed capacity; C_{u3} = utilisation of 50 percent to 70 percent of installed capacity; C_{u4} = utilisation of more than 70 percent of installed capacity. The inputs were stored accordingly in terms of four categories. The explained variable should therefore, be taken as categories and run a general model. However, it is proposed to take one category and its complementary, that is, two categories at a time (i.e., C_{u1} and C_{u2} and others, including C_{u3} and C_{u4}) to focus a particular category. Technically, the proposed model in this case would be called binary logistic model.

The Independent Variables

The variation in utilisation of installed capacity is supposed to be explained by twelve variables that have been identified earlier. But again, in order to use them in a logistic model they are to be specified either as a qualitative (categorical) or as a quantitative variable. The values of the independent variables have been collected from the results of the survey. There had been various possibilities with respect to the outcome of the survey. Such possibilities were captured by specifying the variables in further details. For example, *location of the unit* was a qualitative variable. It was classified into four different categories, which were mutually exclusive, namely, rural, urban, semi urban and others (i.e., location not defined). Similarly, being a qualitative variable, *form of ownership* was spread over a number of alternatives, like sole proprietorship, partnership, private limited companies, public limited companies and cooperatives. Family background of the entrepreneur was also spread over diverse number of options like manufacturing, trade, services, agriculture, etc. Information was collected on nature of activities which included manufacturing, processing, jobwork, trading, servicing, repairing. The respondents mentioned about the competition they faced from other small firms, large Indian firms and multinational corporation's products as well as smuggled and imported goods. The business position of the firm in comparison to their condition prior to 1991-92 was also noted as to have declined or stagnated or grown rapidly/gradually. These were all qualitative variables.

In the computer worksheet, these variables have been numbered for tracking them down, as per their number in the structured questionnaire. For example, question number S5 in the survey questionnaire asked about the location of the unit. The respondent was given a choice among four alternatives, namely, (1) urban, (2) rural, (3) semi-urban and (4) others. The variables were also recorded accordingly as S5(1), S5(2), S5(3) and S5(4). Similarly question number S11 found out about the ownership pattern of the surveyed unit, giving alternatives (1) proprietorship, (2) partnership and so on.

There are 12 such independent variables utilised in the model mentioned later. Out of them, nine are *qualitative* variables that have been converted into categories which in this model work as *indicator variables* (Indicator variables are the outcomes of the Indicator Variable Coding Scheme in Logistic Regression). Following the indicator variable *coding scheme* an entire set of new variables has been generated. (To give meaningful codes to the indicator variables the standardised indicator variable coding scheme is followed. The values of the independent qualitative variable must be recorded by creating a new set of variables that correspond in some way to the original categories. If the indicator variables are used for coding the coefficients for the new variables represent the effect of each category compared to a reference category)

Consider for example, S11#1, which represents the legal status as per the ownership pattern of a unit. It is qualitative in nature but here it has been converted into an indicator variable. While doing so, three categories emerged, namely, S11#1(1) denoting proprietorship units; S11#1(2) denoting partnership units and S11#1(3) combining private and public limited companies and cooperatives. (The units reported to be operating as limited companies and cooperatives have been clubbed together because there were so few respondents in this combined category that their impact, if considered separately would not be rewarding.) Out of these, in a logistic regression one, would serve as the reference category.

The *reference category* is the basic category. Out of the categories that one derives there would be one reference category. In case of legal status (S11), the reference category is chosen to be S11#1(3). *The reference category is the basic category that will not be present in the regression results. However, that is the pivot on which the other variables stand. The estimated coefficient of other indicator variable shall have to be interpreted with respect to the reference category (to what extent it performs better or worse compared to the reference category).* In the SPSS coding scheme that we have followed there is an in-built program, that turns categorical variables into indicator variables and by default it takes one of the independent variables as the reference category (the last one is such a variable).

We use the indicator variable coding scheme for creating the new variables, coefficients of which represent the effect of each category compared to a reference category. The coefficient of the reference category is 0. For example, S11#1(1) is the indicator variable for firms under proprietorship, which is coded 1, when it exists and 0 otherwise. Similarly the variable S11#1(2) includes the firms under partnership, coded 1 if it exists and 0 otherwise. Reference category in both the cases is S11#1(3), which is the indicator for private and public limited companies and cooperatives clubbed together. Similarly all other qualitative variables have been broken up into sub parts while converting them into indicator variables. As a result a total of 31 variables have emerged. The details about them are given in the Annexure.

Current turnover, in Rupees lakhs and the advertisement budget, if any, measured in Rupees lakhs are quantitative variables. Besides, margin on sales that reported the profit earned by the unit as a percentage of its turnover, is also a quantitative independent variable. The three quantitative variables used as independent variables in the models are, S10 representing current turnover (in Rupees Lakhs) reported by the unit, S21VID representing the advertisement budget (in Rupees) and S27(II) representing the margin on sales in percentage terms.

Logistic Regression

As has been already pointed out the ordinary regression based on quantitative information is not found to be applicable in this case because the explained variable, the percentage of installed capacity utilised, being a qualitative variable is considered as a categorical variable in this case. The suggested model that can take care of such an explanatory variable is a logistic regression model. A logistic regression captures the effect of the explanatory variables on the explained variable in probabilistic terms – the probability of odds[ii] against the event. The event in this case is the utilisation of capacity below (or upto) and above a specified level described in binary numbers 0 and 1. The expected outcome of the model is a probabilistic description of the effect of a change in the set of explanatory variables – qualitative or quantitative – on the explained variable that comes in binary form.[iii] In this particular case, in the set of explained variables we have taken the binary numbers as the qualitative variables. The form being so, the model is expected to estimate the probability of the 'event not occurring'.

As stated earlier, it is assumed that the form of the function (2) is logistic. To be specific, the form was taken as binary logistic regression. Accordingly, a logistic regression analysis has been done using SPSS package utilising all the above mentioned variables. Since the suggested model is a *Binary Logistic Regression*, in which the dependent variable can assume only two values, some 'cut off' levels have been set up for capacity utilisation (being the dependent variable). The question that the model would address would be : *What are the factors that explain a firm's entry in a group that utilises the capacity below (or equal) or above the cut off* ? Put in a different way, the model would estimate the contribution of an explanatory variable to the event of a firm's entry to more (above the cut off) or less efficient groups of firms - efficiency being indicated by the percentage of installed capacity utilised by the firm.

The question of selecting the cut off is therefore very important in this exercise. The proposed regression has nothing to suggest about the level that may be selected as cut off. In the Indian small industries scenario, on an average the small industries utilise about 50 per cent of their installed capacity.[iv] It is therefore decided to fix the cut off of capacity utilisation at the level of 50 per cent. In other words, the firms were organised into two groups, namely, those which have reported to utilise 50 per cent or less of their installed capacity and those whose performance is better. The factors that explain the placement of the firms in two different categories were then sought for by applying a logistic regression.

Such an exercise has an indirect bearing on the evaluation of firm efficiency. The firms which are more efficient are expected to utilise the installed capacity in such a way that they would operate at least at a level which is higher than 50 per cent of the installed capacity. With the suggested model under logistic regression, it is expected to get some idea about the factors that would contribute favourably (and also those which contribute unfavourably), to the firm in its endeavor towards gaining efficiency. A regression model that was run covering all these 179 units spread over 21 NIC categories is expected to lay bare the factors that explain the variation in efficiency in the firms in the small scale sector.

Capacity utilisation, the dependent variable in this model is measured in terms of percentage of installed capacity. It is categorised into two classes, that is, the firms which utilise upto 50 per cent of installed capacity form one category and those which utilise more than that are grouped into another. The unit with capacity utilisation less than or equal to 50 percent takes the value 0, others with higher than 50 percent capacity utilisation takes the value 1. The independent variables are those listed in the Annexure.

The Statistical Properties of the Models: General Observations

The results of the models were derived by using the standard statistical packages of SPSS 10.0. In SPSS 10.0, binary logistic regression is under *Analyse - Regression - Binary Logistic.* Unlike Ordinary Least Square (OLS) regression, logistic regression does not assume linearity of relationship between the explained variable and the set of explanatory variables. It also does not require variables to be distributed normally, does not assume homoscedasticity and in general, is based on less stringent requirements than OLS. The success of the logistic regression can be assessed from the classification table, showing correct and incorrect classifications of the dependent (dichotomous in the case) variable. Also, goodness-of-fit tests are available as indicators of success.

The logit coefficients are calculated by maximum likelihood estimation (MLE). It seeks to maximise the log likelihood, which reflects how likely it is that, the observed values of the dependent may be predicted from the observed values of the independent variables. MLE is an iterative algorithm in which an initial function is estimated, residuals are tested and a re-estimate is made with an improved function. The process is repeated until a *convergence* is reached.

In this case, from the SPSS package the 'Backward Selection' criterion was adopted to derive the results of the models. The package has a built-in mechanism to generate a categorical variable coding scheme, which was utilised to create a set of categorical variables (mentioned earlier) with respect to the indicator (qualitative) variables. After this, it applies an iterative algorithm to estimate the logit coefficients following the MLE method. In the SPSS output, the final results with respect to the suggested models are contained in the last part of the output headed 'Variables in the Equation'. It gives the B coefficients, which are interpreted as Log odds [odds are given in the last column Exp. (B)]. The concept of Log odds has to be interpreted carefully in order to get the proper implication of the results. It is the log odds for one outcome versus the other that is assumed to vary linearly against a set of predictors. *The coefficient for a specific explanatory variable represent the change in the log odds that would result from a unit change in the specific explanatory variable, when all other explanatory variables are assumed to be fixed.* This yields the 'odd ratio' which is an approximation of the relative risk or relative gain or the *probability of moving from one scenario to another,* with respect to the dependent variable.

With respect to each explanatory variable there exists a test of significance. The necessary statistic is the Wald Statistic (the square of the ratio of the coefficient to its standard error). However, as a test statistic, Wald is not very reliable because with a huge absolute value of the regression coefficient, the estimated Standard Error is too large (which gives rise to a too small value of Wald Statistic). The consequence would be that, it would fail to reject the Null Hypothesis (that the coefficient is 0) when in fact it should.

The suggested alternative test is the Log-Likelihood ratio test, which is used to assess the overall significance of the model. The maximum likelihood value is obtained from fitting the model and the natural log of the maximum likelihood value is multiplied by – 2. The resulting value lies between - α (indicating non-significance) and + α (showing extreme significance).

The log likelihood ratio test is utilised in SPSS package while running the logistic in an iterative algorithm. It examines the change in the log likelihood when each of the variables is entered into the equation containing the other variable. This in fact is the great merit of Backward LR as a method for variable selection. This method has been used here for deriving the results.

In SPSS 10.0 results summary there exists a package for omnibus tests[v] for model coefficients. The omnibus test table contains a column for chi-square, which is known as model chi-square. Model chi-square is a likelihood ratio test which reflects the difference between errors, not knowing the independent variables and errors when independents are included in the model. When probability (of model chi-square) is less than or equal to 0.05 we reject the null hypothesis that knowing the independents makes no difference in predicting the dependent in logistic regression.

Thus, a researcher would wish to have model chi square to be significant at 0.05 per cent or better for a model that is being applied to the data set.

Given this general discussion on the logistic regression as a tool of analysis, the results of the regression shall be interpreted covering the data set involving 179 small scale industries units.

But before that discussion, a few words on the limitations of the study should be mentioned. In the first place the results of the logistic regression do not contain a coefficient which is exactly analogous to R-Square in multiple regression. Cox and Snell's R-Square and a further modification in Nagelkerke's R-Square attempts to initiate the interpretation of multiple R-Square. However, such R squares do not represent what one gets in Karl Pearson's multiple regression (R-Square) on the strength of the regression. While interpreting the results we do not therefore, discuss the R-Square values, as it is the standard practice in regression analysis. Secondly, there might exist the problem of multi-collinearity. The variance inflation factor (VIF), the reciprocal of tolerance ($1\text{-}R^2$) (which is used for checking whether multi-collinearity is suspected) is not calculated in logistic regression. One will not therefore, be sure whether and to what extent the probability of multi - collinearity exists in the output of the logistic regression. VIF is not calculated because there is no direct counterpart to R-square, being logistic regression. To the extent our independent variable is linearly related to another independent variable, multi-collinearity could be a problem in logistic regression. However, unlike OLS regression, logistic regression does not assume linearity of relationship among independent variables. The Box-Tidwell transformation and orthogonal polinomial contrasts are ways of testing linearity among independent variables. A high odd ratio could be the evidence of multi-collinearity. However, a high odd ratio in itself does not indicate that there exists multi-collinearity in the logistic regression. A low value of Nagelkerke's R square may indicate that the possibility of the existence of multi-collinearity is rather weak because it is the closest approximation to OLS R square.

With these limitations in mind the results of the regression that have been generated are presented below.

Interpreting the Model

This model considers the scenario of a typical Indian firm (capacity utilisation being equal to or less than 50 per cent of installed capacity), counterpoised to the firms which are better placed in terms of capacity utilisation (using greater than 50 per cent of installed capacity). The question that this model tries to answer is, what are the factors that would contribute to a firm's movement from mediocrity to excellence. In other words, the regression attempts to indicate factors that would lead to better utilisation of installed capacity, which *inter alia*, would lead to cost efficiency by way of reduction in overheads and decrease in idle capacity. The prediction is based on 9 independent qualitative variables converted into 31 indicator variables and 3 quantitative variables.

Before interpreting the summary results of the Model it is important to note whether the statistical exercise is justified or not. As has been pointed out in the previous section, in logistic regression this is tested by what is known as, the omnibus test. It tests the null hypothesis that knowing the independents makes no difference in predicting the dependent in logistic regression. With respect to this model this test was performed (Table 2). The results of the omnibus test (0.021), being less than 0.05, we reject the null hypothesis that the inclusion of the independent variables is gainful, it does improve the prediction as regards the behaviour of capacity utilisation.

The overall test of significance, in the form of 2 Log Likelihood was also performed (Table 3). The result has been observed to be highly in favour of the model. The value, 145.676 indicate that the set of independent variables included in the equation has satisfied the overall test of significance. The power of prediction of this model (78 percentage correct) is robust, giving it an extra element of dependability. As observed in the Classification Table^a (Table 4) with respect to the dependent variable, capacity utilisation in this case (S27 1A#3), there are 6 missing cases, but since that accounts for only 3.4 per cent of the reported units (Table 1), it is expected not to affect the model adversely.

The results of the logistic regression described in the final Table 5 may now be interpreted. There are 12 *variables* in the equation with a constant term being - 25.327. The coefficient of the logistic regression are given in column B, SE denotes standard error and Wald is calculated as the square of the ratio of the coefficient to its standard error. Since the beta coefficients are in the form of log odds, the odds ratio is given in the last column of the table as Exp (B). The test of significance for individual beta coefficient given by the Wald Statistic does not to lead us to reject the null hypothesis that B is not significantly different from zero in many of the cases. Since the overall reliability of the model has been justified by the omnibus test and the 2 log likelihood ratio and Wald is not the most dependable guide in assessing the statistical worth of the beta coefficient, it is not much relied upon.

In the estimated regression, there is a constant term that is the intercept in a logistic model. This denotes the base line log odds for a group, when the explanatory variables are ignored. As we get from the Model, the constant term has a negative sign which implies that in the absence of the selected explanatory variable, that is, when the selected explanatory variables become inoperative, there is a negative impact on capacity utilisation. In other words, the explanatory variables do contribute to the small firms' endeavour to enhance its efficiency (which is proxied by capacity utilisation).

As the results indicate the beta coefficient of turnover, as an explanatory variable is positive but very small in magnitude (0.038). This implies that a change in turnover shall have a positive impact on the percentage of installed capacity utilisation by the firm, but the magnitude of such impact is very poor. As the turnover increases, that is, sales increases there is a possibility that the profit would decline, the turnover being constrained by profit (as in Baumol's model), turnover does not seem to have an impact of very high magnitude on the optimising behaviour of a firm and thus, on its aim to increase efficiency. The second quantitative variable is advertisement budget (S21 VI D) whose corresponding Beta Coefficient has an estimated value of 0.413 which is considerably high. The burden of evidence is in favour of the argument that, advertisement budget has a positive impact on the capacity utilisation of a firm and the intensity of the impact is reasonably high with special reference to this model. Advertisement possibly creates a product differentiation, as a consequence to which the firm gets an additional leverage in the market; so much so that the inventory is deflated and the firm finds it necessary to increase the intensity of its capacity utilisation for maximising profit.

Next the impact of the qualitative variables on the capacity utilisation of small firms are considered. There are nine qualitative variables from which thirtyone indicator variables have been generated. Going through the results of the model, it is observed that some of the estimated coefficients have satisfied the Wald test and some have not. Since Wald statistic is not very reliable in judging the statistical worth of a particular regression coefficient and since the test of overall reliability of the model has been satisfied, while analysing the results of the regression all the variables *'included in the model'* are considered and interpreted accordingly.

Taking into consideration the locational issue, as the results indicate, with respect to the firms that have been included in this model, the possibility of utilising more than 50 per cent of installed capacity increases as the firm moves from semiurban to urban and more so when it shifts to rural areas. In the urban segment it enjoys the benefits of external economies of scale due to the existence of better physical infrastructure including a marketing network. On the other hand, in the rural areas it gets the advantages of the availability of low paid unskilled and semi skilled workers that keeps the wage bill low, which will neutralise the lack of advantages through external economies that the urban units enjoy. This point seems to be important because it may explain the observed rural bias of small scale industrial units in India. (As per the Second Census,1988 at an all India level 42.17 per cent of the small scale units are concentrated in the rural sector.)

The variable nature of activity (S14) appears to have a strong interrelationship with capacity utilisation as the values in the B column, are very large. The results indicate that units involved in activities like manufacturing [S14(1)], processing, jobworking, servicing and repairing have higher capacity utilisation in comparison to the units engaged in subcontractual activities. This is probably due to the fact that sub-contracting activities maintain higher idle capacity with the expectations of sudden large orders, which are lucrative.The results also indicate that possibility of better utilisation of installed capacity is likely to increase in servicing, repairing, jobwork, processing and manufacturing (the reference category being sub contracting). Sub contracting being chiefly an urban activity, the results indicate that the small industries in the rural areas which hardly enter into subcontracting activities are likely to utilise the installed capacity in a better way.

However, the family background of such entrepreneurs is an important factor in explaining the efficiency of such enterprises, as the results of the regression analysis indicates. The odds of utilising the installed capacity at more than 50 per cent level increases, had the background of the entrepreneur not been agriculture and other related activities. In other words, the rural enterprises could be efficient if such businesses are taken up by entrepreneurs having trade or services as family background. This can be rationalised by considering the existing scenario of rural West Bengal in which there is a high rate of growth in agriculture (around 6.5 per cent for the last one decade), which has created demand for trade, services and manufactured goods. While the big businesses try to explore the prospects in rural market in West Bengal, there still exists a space for the small enterprises. The possibility is being exploited by people having some exposure to non-firm enterprise activities, mostly from nearby urban areas. Consequently, the rural enterprises are recording a better performance and therefore the prospect of utilising the installed capacity in a better way is increasing in rural West Bengal.

As one observes form the results of the regression, the units catering to the international market, though very few in number, in this survey, have higher capacity utilisation than those dealing with local, state or national markets. This is again evident from the negative values in the B column corresponding to the variable market characteristics. In the international market only the most efficient firm would survive. A firm which is located in the group of enterprises that cater to the demand of the international market has definitely passed the test of efficiency - efficiency considered at the global level. On the other hand, the possibility of the inclusion of a firm at the national or local level decreases the log odds of moving to the category of greater capacity utilisation. The results, however indicate that the differential is not very high, when the comparison is confined to the group of firms operating at the national level and at the international level. The inefficiency is likely to increase as we consider the firms operating at the state level. The local level firms appear to be somewhat better performers most likely due to the fact that they operate in a sort of captive market that generates steady demand at a reasonable price.

Do the sources of competition affect the performance of firms in the small scale sector ? The answer as we get from the empirical exercise, is positive. If we consider the MNCs and the smuggled goods as the reference category, it is observed that the firms are mostly threatened by competition from these sources. The small firms that compete in the product line in which the MNC and the smuggled goods try to enter do not find it encouraging to go on increasing capacity utilisation possibly because the market is shrinked and there is inventory accumulation which has negative impact on capacity utilisation. If however, the competition is confined to the national level large Indian firms, or the small and large Indian firms, or even among small firms, the odds of increasing capacity utilisation increases with respect to the small enterprises that have been considered in this study. The results also indicate that the scenario is not changed very much if we consider only the large Indian firms as the sources of competition. This probably highlights the inner strength of the small units. (Scherer,1970,Survivorship Studies).

Finally the scenario with respect to the small enterprises after the introduction of the new economic policy is considered. The reference of course is capacity utilisation. The respondents were asked two questions in this area. The first was as regards his perception about the market. The answer was supposed to be subjective, indicating how the entrepreneur *feels* about the market - whether there was a decline, stagnation or growth in the market. The respondent was also asked a second question in order to know whether there was a difference in turnover with respect to his business, compared to what it had been in 1991-92. The regression coefficient pertaining to the perception of the respondent about the market behaviour since 1991-92 does not have much bearing on the issue of capacity utilisation as such. Only thing that should be highlighted is that the entrepreneurs who have a pessimistic outlook about the market were found to be utilising the installed capacity in a better way. This was possibly due to the fact that, these entrepreneurs had been quite cautious in managing the fixed resources, so much so that, they could maintain efficiency. To put it rigorously, for the entrepreneurs who were of the opinion that the market had declined since 1991-92 would increase the log odds of increasing capacity utilisation above the stipulated level of 50 per cent was high and positive, the reference category being the entrepreneur who expected a slow or rapid growth.

More meaningful however are the results with 'difference between present and 1991-92 turnover' as explanatory variable. There are two categories of firms; those whose volume of turnover had declined after the introduction of the new economic policy and those who had a better business during this period. It was observed that the possibility of better capacity utilisation increases with firms having a higher turnover during the period under survey than in 1991-92. This is consistent with what one would normally expect. The new economic policy that opened up the small sector to more competition from national and international sources might have created a negative impact for such firms or fail to meet competition. Consequently, their turnover has declined (so also the level of optimum profit). As a result a higher percentage of installed capacity remained idle in such firms. On the other hand, a firm that could meet the challenge could utilise the capacity in a better way and thereby reduce idle capacity. In the short run this is the way in which the impact of a new policy could be realised in a sector. In the long run however, this could pave the way for a new alignment of enterprises; some would disappear from the scene and some others with better records of efficiency would survive. This, of course, cannot be judged from the results of this survey. One cannot get an indication of which firms would survive from the information on the growth prospect, as *perceived by the respondents* of this survey.

The odds of greater capacity utilisation increases not in proprietary or partnership firms. In fact the corporate bodies and cooperatives are found to offer better organisational form for pursuing efficiency. Such behaviour is probably caused by managerial advantages enjoyed by corporate and cooperatives that operate on the basis of a functionally differentiated form of management. As one knows, the functional differentiation denoting specialisation increases efficiency of an organisation. It is therefore expected that the sign of the log odds could be negative when the reference category is company and cooperative. However, this finding, which is consistent with the received wisdom does not add much to this exercise on cost efficiency of the small business. Small enterprises are usually organised in the line of partnership and proprietorship. (In our sample 72 per cent of firms is proprietorship and 16 per cent are partnerships.) The typical form of management in such enterprises is undifferentiated type of management exercised by the entrepreneur.

A small firm does exist in an economy. It is also true that they do not face extinction even after almost three centuries of industrialisation. As Anderson has pointed out, even in countries which, operate at Phase Three of industrialisation there exists the small firms even if they have reached a plateau. However the other side of the reality is that the large firms do dominate the economic scenario and there is an inherent tendency of the firms to accommodate capital and expand its scale of operations. In the competitive world of market economy, this is the logic of the development of monopoly capital. Within the group of small firms the same process is operative, although there exists a vast number of small units they survive by exploiting various social and economic opportunities. These factors are very powerful as we observe in this study. However, the small industry also cannot escape the rule of capitalism that creates advantages for the bigger firms. If the limited companies and cooperatives, which operate on a higher scale, are found to be more efficient than the proprietary and partnership firms are, it indicates that the rule of capital is very much operative in the field area. Firms of larger scale would therefore dominate the world of small enterprises. The others might survive as they are found to survive in history but they are destined to remain dominated by the world ruled by the big businesses.

One will feel rewarded if this study is received among the concerned scholars, as one, that attempts to explore reality of the small industries in a modest way.

Logistic regression

Table 1 : Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	173	96.6
	Missing Cases	6	3.4
	Total	179	100.0
Unselected Cases		0	.0
Total		179	100

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
1	0
2	1

Categorical Variables Codings

			Parameter coding				
		Frequency	(1)	(2)	(3)	(4)	(5)
S14	1	130	1.000	.000	.000	.000	.000
	2	9	.000	1.000	.000	.000	.000
	3	21	.000	.000	1.000	.000	.000
	4	6	.000	.000	.000	1.000	.000
	5	6	.000	.000	.000	.000	1.000
	6	1	.000	.000	.000	.000	.000
S21I	1	120	1.000	.000	.000		
	2	15	.000	1.000	.000		
	3	36	.000	.000	1.000		
	4	2	.000	.000	.000		
S21VII#1	1	133	1.000	.000	.000		
	2	9	.000	1.000	.000		
	3	28	.000	.000	1.000		
	4	3	.000	.000	.000		
S12#1	1	47	1.000	1.000	.000		
	2	48	.000	.000	1.000		
	3	61	.000	.000	.000		
	4	17	.000	.000			

			Parameter coding				
		Frequency	(1)	(2)	(3)	(4)	(5)
S11#1	1	125	1.000	.000			
	2	30	.000	1.000			
	3	18	.000	.000			
S5#1	1	149	1.000	.000			
	2	18	.000	1.000			
	3	6	.000	.000			
S24#1	1	62	1.000				
	2	34	.000				
	3	77	.000				
S21VIA	1	54	1.000				
	2	19	.000				
S18#2	1	113	1.000				
	2	60	.000				

Block 0 : Beginning Block

Classification Table^{a,b}

			Predicted		
			S271A#3		Percentage
	Observed		1	2	Correct
Step 0	S271A#3	1	0	40	.0
		2	0	133	100.0
	Overall Percentage				76.9

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	1.201	.180	44.390	1	.000	3.325

Variables not in the Equation

			Score	df	Sig.
Step	Variables	S5#1	1.903	2	.386
O		S5#1(1)	.653	1	.419
		S5#1(2)	1.630	1	.202
		S10	1.749	1	.186
		S11#1	.227	2	.893
		S11#1(1)	.196	1	.658

	Score	df	Sig.
S11#1(2)	.199	1	.656
S12#1	4.307	3	.230
S12#1(1)	2.458	1	.117
S12#1(2)	1.366	1	.243
S12#1(3)	.174	1	.677
S14	10.786	5	.056
S14(1)	.737	1	.391
S14(2)	5.619	1	.018
S14(3)	.006	1	.936
S14(4)	1.869	1	.172
S14(5)	.146	1	.703
S21I	4.805	3	.187
S21I(1)	.241	1	.624
S21I(2)	2.632	1	.105
S21I(3)	2.180	1	.140
S21VIA(1)	8.552	1	.003
S21VID	.272	1	.602
S21VII#1	2.939	3	.401
S21VII#1(1)	.103	1	.748
S21VII#1(2)	2.428	1	.119
S21VII#1(3)	.521	1	.470
S24I#1	.966	2	.617
S24I#1(1)	.252	1	.616
S24I#1(2)	.942	1	.332
S27II	.081	1	.776
S18#2(1)	3.774	1	0.52
Overall Statistics	33.972	25	.109

Block 1 : Method = Enter

Table 2 : Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	41.420	25	.021
	Block	41.420	25	.021
	Model	41.420	25	.021

Table 3 : Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	145.676	.213	.322

Table 4 : Classification Table[a]

Observed			Predicted		
			S27IA#3		Percentage Correct
			1	2	
Step 1	S27IA#3	1	12	28	30.0
		2	10	123	92.5
	Overall Percentage				78.0

a. The cut value is .500

Table 5 : Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step	S5#1			3.392	2	.183	
1[a]	S5#1(1)	1.073	1.141	.884	1	.347	2.924
	S5#1(2)	2.358	1.376	2.937	1	.087	10.570
	S10	.038	.028	1.801	1	.180	1.039
	S11#1			.239	2	.887	
	S11#1(1)	-.557	1.151	.234	1	.628	.573
	S11#1(2)	-.587	1.292	.206	1	.650	.556
	S12#1			3.258	3	.354	
	S12#1(1)	1.395	.823.	2.874	1	.090	4.035
	S12#1(2)	.583	.779	.560	1	.454	1.792
	S12#1(3)	.901	.791	1.298	1	.255	2.461
	S14			1.215	5	.943	
	S14(1)	21.902	100.213	.048	1	.827	3.25E+09
	S14(2)	21.353	100.216	.045	1	.831	1.88E+09
	S14(3)	22.282	100.223	.049	1	.824	4.75E+09
	S14(4)	30.766	106.759	.083	1	.773	2.30E+13
	S14(5)	22.547	100.213	.051	1	.822	6.20E+09
	S21I			1.956	3	.582	
	S21I(1)	-.695	32.469	.000	1	.983	.499
	S21I(2)	-1.383	32.460	.002	1	.966	.251
	S21I(3)	-.099	32.463	.000	1	.998	.905
	S21VIA(1)	-1.206	.485	6.173	1	.013	.299
	S21VID	.413	3.455	.014	1	.905	1.511

	B	S.E.	Wald	df	Sig.	Exp(B)
S21VII#1			1.024	3	.795	
S21VII#1(1)	3.718	5.955	.390	1	.532	41.162
S21VII#1(2)	3.028	6.024	.253	1	.615	20.652
S21VII#1(3)	3.811	5.953	.410	1	.522	45.185
S24I#1			1.204	2	.548	
S24I#1(1)	.184	.563	.107	1	.743	1.202
S24I#1(2)	-.492	.611	.649	1	.420	.611
S27II	-.005	.028	.033	1	.855	.995
S18#2(1)	.519	.488	1.131	1	.288	1.681
Constant	-25.327	105.780	.057	1	.811	.000

a. Variable(s) entered on step 1 : S5#1, S10, S11#1, S12#1, S14, S21I, S21VIA, S21VID, S21VII#1, S24I#1, S27II, S18#2.

ANNEXURE

LIST OF VARIABLES

Sl. No.	Code No.	Name of Variable	Type
1.	S 5 # 1	Location of the Unit	Qualitative
2.	S 5 # 1 (1)	Urban	Categorical
3.	S 5 # 1 (2)	Rural	Categorical
4.	S 5 # 1 (3)	Semi-urban and others	Reference
5.	S 10	Turnover (in Rs.Lakhs)	Quantiative
6.	S 11#1	Legal Status of the unit	Qualitative
7.	S 11#1 (1)	Proprietorship	Categorical
8.	S 11#1 (2)	Partnership	Categorical
9.	S 11#1 (3)	Private Limited Company, others clubbed together	Reference
10.	S 12 # 1	Family Background of the Entrepreneur	Qualitative
11.	S 12 # 1 (1)	Manufacturing	Categorical
12.	S 12 # 1 (2)	Trade	Categorical
13.	S 12 # 1 (3)	Service	Categorical
14.	S 12 # 1 (4)	Agriculture and others	Reference
15.	S 14	Nature of Activity	Qualitative
16.	S 14 (1)	Manufacturing	Categorical
17.	S 14 (2)	Processing	Categorical
18.	S 14 (3)	Job Work	Categorical

19.	S 14 (4)	Servicing	Categorical
20.	S 14 (5)	Repairing	Categorical
21.	S 14 (6)	Subcontracting	Reference
22.	S21 I	Market Characteristics	Qualitative
23.	S21 I (1)	Local Market	Categorical
24.	S21 I (2)	State Market	Categorical
25.	S21 I (3)	National Market	Categorical
26.	S21 I (4)	International Market	Reference
27.	S21 V I A (1)	Yes, Advertised	Categorical
28.	S21 VI A (2)	No, Did not Advertise	Reference
29.	S21 VI D	Advertisement Budget (in Rs.)	Quantiative
30.	S21 VII # 1	Sources of Competition	Qualitative
31.	S21 VII # 1(1)	Competition from Small Firms	Categorical
32.	S21 VII # 1(2)	Competition from Large Indian Firms	Categorical
33.	S21 VII # 1(3)	Competition from both Small and Large Firms	Categorical
34.	S21 VII # 1(4)	Competition from Multinationals and Smuggled Goods	Reference
35.	S24 I # 1	Growth since 1991-92	Qualitative
36.	S24 I # 1 (1)	Decline in growth since 1991-92	Categorical
37.	S24 I # 1 (2)	Stagnation in growth since 1991-92	Categorical
38.	S24 I # 1 (3)	Slow or Rapid growth since 1991-92	Reference
39.	S27 II	Margin on Sales (in percent)	Quantiative
40.	S18 # 2 (1)	Positive difference between present turnover and turnover before1991-92	Categorical
41.	S18 # 2 (2)	Negative difference between present turnover and turnover before 1991-92	Reference

NOTES

[i] It sometimes happens that data for a theoretically relevant variable are not available. Proxy variables substitute for theoretically desired variables when data on the desired variables are incomplete or missing altogether.

[ii] The measure of odds is given as : Odds = Prob (event) / 1-Prob(event)

Log odd is logarithmic value of this expression.

[iii] In Logistic regression, one directly estimates the probability of an event occurring. For the case of a single independent variable, the logistic regression model can be written as,

Prob (event) $= \frac{e^{\beta_0}+\beta_1 X}{1+e^{\beta_0}+\beta_1 X}$ Or equivalently, *Prob(event)* $= \frac{1}{1+e^{-\left(\beta_0+\beta_1 X\right)}}$

[iv] According to the SIDO data the average rate of utilisation of their installed capacity in Indian small firms is 53 per cent.

[v] In SPSS 10.0, model Chi-square is the "Chi-Square" value printed in the "Omnibus Tests" table, reflecting the difference between the initial -2 Log likelihood (- 2LL) shown in the "Iteration history" table and the deviance chi-square shown as -2LL in the "Model Summary" table.

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FLOW OF FDI TO DEVELOPING COUNTRIES — THE ISSUES INVOLVED

Jita Bhattacharyya *

Abstract : Foreign Direct Investment may take numerous forms including — (a) the establishment of a branch or subsidiary in a foreign country, (b) the expansion of an existing branch or subsidiary, and (c) the acquisition of an overseas business enterprise whether wholly or substantially. In addition to financial resources, FDI is regarded as promoting economic growth through the transfer of technology and various skills by effecting structural changes. This paper attempts to examine the factors, which mainly influence — (a) the flow of FDI in general and (b) the flow of FDI in developing countries in particular. The factors, which mainly influence the flow of FDI to developing countries are labour costs, quality of labour, infrastructure, incentives to investment including tax rates, government policy, market factors and foreign exchange rates.

Key Words : Foreign direct investment, disequilibrium conditions, government-imposed distortions, Product Life Cycle Theory of FDI, Eclectic Paradigm or OLI Paradigm, Location Theory, Kindleberger's Condition, Lenin's condition, Quality of Labour, Insfrastructure

Many developing countries are in recent years introducing various policy measures to encourage foreign direct investment (FDI) in different sectors of the economy. Therefore, it would not be out of context to discuss the factors which induce the flow of FDI to developing countries. FDI refers to the acquisition abroad of plant and machinery and other physical assets with the operational control being in the hands of the parent company in the home country. It differs from portfolio investment, which is made with the intention of deriving a stream of investment income in the form of dividend, capital gains, etc., but without the intention of acquiring operational control. FDI may take numerous forms including —

(a) the establishment of a branch or subsidiary in a foreign country,

(b) the expansion of an existing branch or subsidiary, and

(c) the acquisition of an overseas business enterprise whether wholly or substantially.

In addition to financial resources, FDI is regarded as promoting economic growth through the transfer of technology and various skills by effecting structural changes.

This paper attempts to examine the factors, which mainly influence—(a) the flow of FDI in general and (b) the flow of FDI to developing countries in particular.

Why FDI Flows to Other Countries — A Conceptual Discussion

The emergence of MNCs consequent upon the tremendous flow of FDI after World War II resulted in various studies relating to the international movement of capital. One of the earliest theories was developed by MacDougall (1960) and subsequently elaborated by Kemp (1964) and agreed to by Robson (1998). They assumed a two-country model — one being the investing country and the other the host country, and the price of capital being equal to its marginal productivity. They explained that, when capital moves freely from one country to another, capital movement would occur from the country where the marginal productivity of capital is lower towards the country where it is higher. This ultimately equalises the marginal productivity or profit rates between the two countries and benefits both the investing country and the host country. This theory is, however, appropriate when capital movement takes place between countries with the same level of development and similar production functions.

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Hymer (1960) and Kindleberger (1969) have argued that imperfections in the national and international product and factor markets are the major determinants of FDI. Other major contributors in this field have been Caves (1971), Vernon (1966), Buckley and Casson (1976) and Dunning (1977). Various theories have been reviewed by Hood and Young (1979) and Calvet (1981). On the basis of varying degrees of market imperfections, Calvet has classified the determinants of FDI into the following four major classes :

1. market disequilibrium hypothesis
2. government-imposed distortions
3. market structure imperfections
4. market failure imperfections

In the first case, disequilibrium conditions give rise to profit opportunities. FDI flows occurs under such disequilibrium conditions and continues until equilibrium is restored. Actions of profit-seeking firms and arbitrageurs will soon restore equilibrium. FDI under such circumstances is considered to be transitory in nature.

In the second situation, government-imposed distortions like tariffs, import quotas and differences in national tax systems, may affect the market for real goods, raw materials, foreign exchange and domestic capital. These may make export less attractive and create incentives to invest abroad giving rise to FDI.

In the third case, large MNCs may deviate from perfectly competitive behaviour and resort to oligopolistic behaviour because of their superior power to manipulate market prices. On the one hand, such firms may create barriers to the entry of new firms by the creation of new products in the market place. On the other hand, they may indulge in the prediction and emulation of the actions of competitors. Such firms may thereafter make FDI.

According to the Product Life Cycle Theory of FDI developed by Vernon (1966), during the maturity stage, the well-established production technology creates opportunities for long production runs. But competition from similar products reduces profits and seems to affect production costs. As a consequence, production facilities abroad are sought to avail of lower costs there so as to ensure that positive domestic and overseas profit margins are maintained even during the decline of the product. This strategy is intended to prolong the profitable life of the product and is, therefore, a defensive strategy. This idea of defensive FDI has been extended by Knickerbocker

(1974) with the "follow the leader" behaviour of some firms. Thus, when a member of the oligopolistic group invests abroad, the others follow suit.

Caves (1971), has explained that the MNC has an immense capacity to differentiate its products in the domestic market by making small changes, whether real or imputed. This not only helps it to safeguard its products in the domestic market from imitation but also helps in keeping alive consumer interest in the product. However, this can be done only by making considerable investments in research and general marketing functions. This, in turn, enables it to continue producing new products more cheaply than its competitors. The successful MNC would then like to pass on this unique technology and marketing skill at little or no extra cost in overseas markets and to maximise profits on the heavy expenditure it has incurred on research and development. This will lead to FDI.

In the fourth situation, markets fail particularly due to departures from the perfect market assumption with respect to techniques of production and properties of commodities. The most important commodity involved here is technical and managerial knowledge. The characteristics of knowledge are such that make its production as well as transfer rather problematic. An unscrupulous licensee may steal the knowledge and use it for his own advantage. Hence it becomes desirable to transfer the 'knowledge' within a single firm justifying FDI over other alternatives of penetrating foreign markets. Hennart (1988) has argued that due to such reasons FDI can be expected to be more frequent in case of technology-based companies desiring to protect trade secrets.

The Eclectic Paradigm or OLI Paradigm

Dunning (1979) has tried to integrate many of the FDI theories (viz., Industrial Organisation Theory, the Internal Organisation Theory and the Location Theory) into an 'eclectic paradigm' or 'OLI (ownership, location and internalisation) paradigm' of international production by MNCs. Dunning (1981) has clarified the role of the ownership, location and internalisation advantages in the context of international involvement of a firm. The possession of ownership-specific advantages alone will lead to licensing and contractual resource transfers. Export or licensing will be chosen if ownership and internalisation advantages are present. If all the three advantages of ownership, internalisation and location are present, the firm will prefer FDI to the other two kinds of foreign involvement, viz., export and licensing.

Flow of FDI to Developing Countries

Of the three facets of the OLI paradigm, the Location Theory of Hood and Young (1979) is most appropriate in explaining why FDI flows from developed countries to less-developed ones. In this section, an attempt has been made to examine the factors, which mainly influence the flow of FDI to less-developed or developing countries in particular. The important determinants are labour costs, quality of labour, infrastructure, incentives to investment including tax rates, government policy, market factors and foreign exchange rates.

Labour Costs

A cheaper labour force, in the host country as compared to the foreign country, is one of the factors influencing the flow of FDI from the foreign country to the host country. FDI will flow from high labour cost countries to low labour cost countries in pursuit of cost minimisation (Calvet 1981). According to Dunning (1988), locational advantages are the most important determinants of FDI flow to less developed areas where more inward FDI is received than outward. Dunning's model, however, cannot distinguish between locational variables. Sasaki (1994) revises the Ricardian theory by incorporating the difference in production functions, and points out two conditions of FDI—the first is the *Kindleberger's condition* (i.e., foreign capital must have a competitive advantage against local capital) and the second is the *Lenin's condition* (i.e., the host country must have the quality and quantity of labour and a developed infrastructure in order to operate with foreign capital).

But the question involved is why capital would move from an advanced country to a less-advanced country. If there are two countries — one advanced and the other less-advanced — producing tradable goods and employing the same quality of labour, then, if the cost of labour is cheaper in the less-advanced country, capital will move from the advanced country to the less-advanced foreign country in order to seek higher profit rates. In other words, cheaper labour costs in the less-advanced country would encourage an MNC in the advanced foreign country to invest as FDI in the less-advanced country. Again, if there are two or more countries competing as possible recipients of FDI, the country with the highest labour coefficient will be able to attract the FDI. It also follows that FDI will flow to the most advantageous sector of the less-developed country. However, it must be remembered that labour cost is only one of the factors for the flow of FDI.

Quality of Labour

The quality of labour is a representative variable of the labour coefficient. It is an important factor in attracting FDI as it reflects on technology. It is one of the most important factors that determine whether or not the technology developed in the advanced country can be applied in the less advanced host country. Cheap labour by itself cannot attract FDI unless the requisite 'quality' of labour is available in the host country. The 'quality' of labour cannot be measured quantitatively. However, the level of education (including technical education) and labour productivity in the host country can be useful indicators.

Infrastructure

The infrastructure in the host country must be sufficiently developed to attract FDI. This accords with *Lenin's condition* that a sufficiently developed infrastructure creates an environment conducive to investment. It influences productivity and also provides access to the market. The two most important indicators of infrastructure are transport (including passenger car, railway, maritime transport and airways) and communication (including telecommunications).

Investment Incentives

Agarwal (1980) has pointed out that investment incentive is an important determinant of inward FDI. Various policy measures aimed at liberalizing capital movement, revised investment laws, and other incentives are introduced/offered by different developing countries for attracting FDI. Tax rate is also an important incentive/disincentive influencing the flow of FDI. If tax rates are different in different countries, MNCs may be tempted to invest in a low-tax country even though the cost of production may be higher there (Devereux and Pearson 1989). Tax here includes both the corporate tax and the withholding tax.

Government Policy

Developing countries, in particular, often attempt, either directly or indirectly, to control imports in order to protect 'domestic industries'. To circumvent such barriers to entry in the form of exports, MNCs often resort to FDI.

Market Factors

The market of a developing country is often expected to be less exploited/saturated than that of an advanced country. The potential size, type and inadequate nature of competition from domestic firms and other MNCs may provide impetus to FDI. FDI would be preferred to exports if cultural specialties require modifications in products to suit the tastes and budgets of the customers.

Foreign Exchange Rates

Firms from strong-currency countries move out to weak-currency countries (Aliber, 1971). The income stream in a weak-currency country is associated with greater exchange rate risk. This enables a firm coming from a strong-currency country to capitalise its income at a higher rate. Aliber's hypothesis explains why FDI flows from a strong-currency (usually advanced) country to a weak-currency (usually less advanced) country.

Froot and Stein (1989) have pointed out that depreciation in the real value of currency of a country lowers the wealth of domestic residents in comparison to the wealth of foreign residents. This makes it cheaper for foreign firms to acquire assets of domestic firms and attracts FDI. Another theory has been developed by Caves (1988). He has explained how exchange rates influence FDI. Depreciation in the value of a currency, which is expected to be reversed in the near future, creates expectation of capital gains. This leads to inflow of FDI.

The recent increase in the flow of FDI particularly to developing countries has necessitated an in-depth understanding of the causal factors. This article is only a modest attempt to highlight and examine, in brief, the most important of such factors.

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MARKETING COSTS AND MARGINS OF AGRICULTURAL PRODUCES IN TRIPURA

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Abstract : Marketing costs and the marketing margin between the cultivator and the consumer may be taken as an index of the soundness of the marketing set up of any produce. The present study estimates the average marketing costs and margins of marketing agencies in consumer price of paddy rice, vegetables and fruits with reference to transactions made in a few selected regulated markets of Tripura. The study reveals that the price spread in agricultural market of Tripura is considerable and the cultivator's share of the consumer's price is not adequate particularly in case of vegetable and fruit farmers.

Key Words : Agricultural marketing, Marketing costs, Marketing margins, Regulated Markets.

There is perhaps no scope for any disagreement that in an industrially backward state like Tripura, accelerated growth of agricultural production is a crucial necessity for its development. At the same time, it cannot be denied that effective "marketing of agricultural produces" are supposed to bring augmentation as well as diversification of agricultural products and thereby enable the rural cultivators to make economic gains (Agarwal, 1988). Agriculture and allied activities in Tripura contribute nearly 45 percent to 50 percent of state income and provide livelihood to about 70 percent of the state population. Therefore the marketing costs and margins of agricultural products in Tripura cannot simply be ignored but requires special attention for the economic development of the state.

MARKETING COSTS AND MARGINS — Meaning and significance

Marketing costs are the actual expenses incurred in the marketing process. They include not only the cost of performing the various marketing functions but different levies as well. The costs of performing the marketing function include transportation cost, labour charges, packaging, storing processing etc. Marketing margins are actual amounts received by the marketing agencies in the marketing process (Moore, Johl and Khusro, 1973).

The marketing margin between the cultivator and the consumer may be taken as an index of the soundness of the marketing set up of any produce (Gopalaswamy, 1977). A number of studies stand to confirm that a large number of middlemen function at various stages of agricultural marketing in India and they reduce the share of the consumer's price (Krishnaswamy, Hari Narayan and Vijay Kumar, 1968). The prices spread in Indian market is thus considerable and the cultivator's share

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of the consumer's rupee is very small. Retailers and wholesalers together often grab as much as 40 paise out of every rupee paid by the consumer. (M. C. Munshi, 1957). This highlights the high marketing cost and relatively high marketing costs indicate the inefficient market pattern.

THE PRESENT STUDY

Tripura has, in fact, two types of cultivation in the two distinct topographical regions. One-third of the population, the tribesmen mainly dwell in the hills and sustain living by a primitive method of cultivation knwn locally as 'Jhum'. The rest of the rural population live on the plains and practice settled cultivation with semimodern or modern techniques. The market arrivals of agricultural produce in Tripura may broadly be grouped as foodgrains, vegetables and fruits. Paddy-rice constitutes the major share in foodgrains. Vegetables consumed and fruits include locally available fruits like banana, jackfruit, pineapple, woodapple, lichi, etc. The market share of other agricultural produces are negligible and their market arrivals are also irregular.

So far as market scenario is concerned, there are at present, altogether 564 markets in the state, of which 474 are primary markets and 83 are wholesale assembling markets and 7 municipal markets. The state has 21 regulated markets and only 1 terminal market situated at the state capital, Agartala.

In the above backdrop, the present discourse is an attempt to assess the marketing costs and margins of agricultural produces in Tripura. The object of the study is to estimate the average marketing costs and margins of marketing agencies in consumer price of paddy rice, vegetables and fruits. The hypothesis of the study is that the cultivators of the state are deprived of adequate margin in the consumer price of their produces. The study is based on the extensive survey made in a few selected regulated markets of Tripura done in connection with an UGC sponsored Minor Research Project. In the present study, out of 21 regulated markets, five markets namely Bishalgarh, Sonamura, Garjee, Nutan Bazar and Kulai are considered as sample regulated markets to assess the marketing costs and margins. Though the transportation of agricultural produces from the above mentioned markets to the state's only terminal market Agartala occupies a sizeable share. it may not give a general view of the state. Moreover, the study relates to a certain number of transactions made during the year 1999-2000. In dealing with the issues the study relies upon the opinions perceived on the basis of discussions with cultivators, cultivator-cum-traders, consumers, middlemen, arhyatdars, dealers, transport operators and other persons involved in the marketing process of sample markets. Prices of agricultural produces at sub-divisional level and at terminal market level have also been crosschecked to arrive at consumer's price.

FINDINGS AND DISCUSSION

The marketing costs and margins involved in transactions of agricultural produces i.e., paddy-rice, vegetables and fruits, in sample markets are presented in Tables I, II and III.

It is evident from the Table I that cultivator's average share in consumer's price in the sample markets varies between 79.56 to 82.05 percent in case paddyrice marketing. While the miller's or wholesaler's margin varies between 3.91 and 5.13 percent in consumer's price. Therefore, it can be said that the retailers and wholesalers consume as much as 7.66 to 8.88 percent with a total average of 8.08 percent of consumer's price. Transport charges, in rice marketing are also not much significant except in case of Nutan Bazar to Agartala, which is quite high. However, processing charges, which include milling, boiling, cleaning etc. considerably contribute to total price. Other marketing expenses like packing, commission to local touts, tolls, rent, storage, etc. are relatively low in case of marketing from Garjee to Agartala. The figures are in relation to 40 transactions in Bishalgarh, 48 transactions in Sonamura, 26 transactions in Garjee, 17 transactions in Nutan Bazar and 37 transactions in Kulai market respectively.

Table II shows the vegetable marketing costs and margins involved in marketing process from the five regulated markets to the terminal market at Agartala. It is shown in the table that the farmer's share in the consumer's price in these markets lies between 44.38 to 54.63 percent with a total average of 50.51 percent only. Therefore, it can be stated that nearly 50 percent of every rupee in price goes to marketing set up including transportation cost. Wholesaler's margin lies between 15.77 and 23.07 percent (total average 17.93 percent). Another feature in case of vegetable marketing is the presence of local arhyatdar or commission agent who collects vegetables either from the markets or directly from the farmers. He maintains liaison between the wholesaler and the farmer. His average estimated margin is 5.72 percent in Bishalgarh, 8.74 percent in Sonamura market, 6.11 percent in Kulai market, 4.68 percent in Garjee market and 4.09 percent in Nutan Bazar market. The retailer's margin is estimated as 19 percent in consumer price. Middlemen's share in consumer price thus comes to nearly 42 percent of consumer's price. Transportation charges are comparatively high in case of Nutan Bazar. Marketing expenses, including rent, tolls, packing etc. lie between 1.13 and 1.80 percent of consumer's price, while loading, unloading and other labour charges are between 0.79 and 1.11 percent of Consumer's price.

Table III depicts the average fruit marketing costs and margin involved in transactions in sample regulated markets to the terminal market. The figures are in relation to 152 transactions in Sonamura, 100 in Bishalgarh 109 in Kulai, 102 in Nutan Bazar and 176 in Garjee. The table shows that the farmer's margin in consumer's price on an average is 34.62 percent varying between 27.20 percent and 45.79 percent among the selected regulated markets. On the other hand, middleman's margin (local karbari/wholeseller and retailer's margin together) is 58.35 percent. It is to be mentioned that on an average only one-third of the consumer's price goes to the farmer while the middleman's margin is much higher than the farmer's share. The retailer's margin is the same in all cases.

In the marketing of agricultural produces the farmer has been the price taker in all cases. Therefore, if the farmer's share in the consumer's price is inadequate he will not be encouraged for further production. The hypothesis of the study was

TABLE I

Average paddy-rice marketing costs and margins involved in transactions in sample regulated markets to terminal market (Agartala)

(in percentage)

ITEMS	Regulated Markets To Agartala					AVERAGE
	Bishal-garh	Sona-mura	Garjee	Nutan Bazar	Kulai	
	1	2	3	4	5	
1. Processing charges (Milling/boiling/ cleaning etc.)	7.48	6.82	5.42	5.62	6.25	6.32
2. Transport charges.	1.72	2.04	1.87	3.12	2.50	2.25
3. Loading, unloading and other labour charges.	1.52	1.41	1.36	1.00	1.25	1.31
4. Other marketing expenses (packing/ commission/tools/ stores etc.)	0.98	1.01	1.02	1.62	1.56	1.24
5. Miller's or whole seller's margin.	4.00	3.91	4.53	4.07	5.13	4.33
6. Retailer's margin	3.75	3.75	3.75	3.75	3.75	3.75
7. Cultivator's share	80.55	81.06	82.05	80.82	79.56	80.80
8. Consumer's price	100	100	100	100	100	100
Based on number of Transactions.	40	48	26	17	37	33.60

Source : Field Study

* Includes variety of paddy-rice and Jhum rice.

** Excludes holding cost and hence increased margins.

*** During the period 1999-2000.

**** Consumer's price are taken at terminal market, i.e. Agartala, consisting of seven municipal markets. Hence retailer's margin are same in all cases.

TABLE II

Average vegetables marketing costs and margins involved in transactions in sample regulated markets to terminal market (Agartala)

(in percentage)

Items	Regulated Markets To Agartala					Average
	Bishalgarh	Somamura	Garjee	Nutan Bazar	Kulai	
	1	2	3	4	5	
1. Transportation charges.	1.80	2.07	3.03	5.88	3.96	3.35
2. Loading, unloading and other labout charge.	1.03	0.94	1.11	0.79	0.98	0.97
3. Marketing expenses (stores/tools/ packaging etc.).	1.53	1.80	1.13	1.19	1.22	1.37
4. Arhyatdar's Margin	5.72	8.74	4.68	4.09	6.11	5.87
5. Wholesaler's margin	17.00	23.07	16.42	17.41	15.77	17.93
6. Retailer's margin	19.00	19.00	19.00	19.00	19.00	19.00
7. Farmers share	53.92	44.38	54.63	51.64	52.96	50.51
8. Consumer's price	100	100	100	100	100	100
Based on number of Transactions.	119	131	63	44	71	85.6

Source; Field Study

* Includes variety of non-storable perishable vegetables.

** During the period 1999-2000.

*** Consumer's price are taken at terminal market i.e. Agartala, consisting of seven municipal markets. Hence retailer's margin are same in all cases.

TABLE III

Average vegetables marketing costs and margins involved in transactions in sample regulated markets to terminal market (Agartala)

(in percentage)

Items	Regulated Markets To Agartala					Average
	Sona-mura	Bishal-garh	Kulai	Nutan Bazar	Gar jee	
	1	2	3	4	5	
1. Transportation charges.	2.68	0.98	4.02	4.90	3.35	3.19
2. Loading, unloading and other labour charges.	1.00	1.09	1.20	1.31	1.49	1.22
3. Marketing expenses (Stores/tolls/ packing etc.)	2.63	2.04	3.18	2.44	2.82	2.62
4. Wholeseller's margin	32.74	28.10	39.75	38.00	43.14	36.35
5. Retailer's margin	22.00	22.00	22.00	22.00	22.00	22.00
6. Farmer's share	38.95	45.79	29.85	31.35	27.20	34.62
7. Consumer's price	100	100	100	100	100	100
Based on number of Transaction.	152	100	109	102	176	100

Source : Field Study

* Includes locally marketed fruits like Banana, Jack-fruit, Pineapple, Woodapple, Lichi etc.

** During the period 1999-2000.

*** Consumer's price are taken at terminal market i.e. Agartala consisting of seven municipal markets. Hence retailer's margin are same in all cases.

that the cultivators are deprived of adequate margin in consumer price. However, it appears from the above mentioned tables that the paddy-rice farmers of the sample regulated markets get comparatively better margin in consumer price followed by vegetable farmers and fruit farmers. In case of paddy-rice marketing in sample regulated markets it is seen that the farmer's share in consumer's price is around 80 percent, which speaks the presence of compartively strong marketing set up. In case of vegetable marketing it is found that the farmer's share is around 50 percent, and in that of fruit marketing it is only 34.62 percent. Comparatively better margin of cultivators in the price of paddy-rice may be attributed to commercial production, government policy. locally suited quality, market arrivals of rice from other states with higher transportation cost due to its geographical location, etc. In this context it may be mentioned that most of the necessary goods are supplied to the sample regulated markets from the terminal market (Agartala) by the only mode of transportation, trucks. These trucks often have to return empty and at times are hired by traders or cultivators of paddy-rice at a nominal charge. It is observed during the field survey in sample markets that other major foodgrain produces and cash crops are marketed in exchange of inadequate farmer's margin under unfavourable market conditions. As the flow of agricultural produces are towards the only terminal market in Agartala, retailer's margin in all cases are same in the marketing of respective agricultural produces.

Concluding Remarks

The cultivator's poor economic condition resulting in distress sale of agricultural produces is perhaps the foremost cause of defective marketing, particularly in case of fruit and vegetable marketing. It may be mentioned that out of total 3,18,212 operational holdings in the state, there are 2,16,826 marginal holdings (i.e. below 1.00 hectare) and 69,217 small holdings (i.e. between 1.00 and 2.00 hectares). On the other hand, there are only 166 large holdings (i.e. above 10 hectares) in the state. Thus, it implies that sale of agricultural produces in rural markets of Tripura are dominated by marginal and small cultivators. Moreover, commercial production of agricultural produces like fruits and vegetables except a few are still lacking in rural areas. Therefore, it is very difficult to identify any market for any specific produce on a large scale and commercial basis. Thus collection of produces from different locality involves local arhyatdars or agents which further deduct consumer's price.

The majority of the population of the state is below poverty line in rural areas. About 43 percent of its total population come from relatively backward scheduled tribe and scheduled caste communities, basically depending upon agriculture mainly shifting cultivation. Therefore, effective agricultural marketing in the state is essential for overall development of the people of Tripura. Unless adequate care in agricultural marketing is taken it is very difficult to think in terms of development. The basic issue that arises is whether the price leaves the farmers enough margin to induce him to produce more. Adequate market and marketing facilities can probably be the appropriate answer to this question.

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COST ANALYSIS OF PADDY : A CASE STUDY BASED ON HOUSEHOLD FARMS IN NADIA, WEST BENGAL

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Abstract : Against the backdrop of the pre-eminent role of agriculture in the Indian economy, this paper aims at analysing costs of various paddy categories within a sample of selected farms. The major objectives are to : (i) assess the magnitude of change in unit cost with respect to different elements of cost of paddies over different size classes of sample farms, (ii) determine cost patterns of various types of paddies, (iii) analyse the cost fluctuations among various types of paddies and (iv) identify low cost and high cost areas.

Key Words : Agriculture; paddies; composite cost analysis; cost per hectare; cost fluctuation; cost control.

1. Introduction

Agriculture is the past, present and perhaps, the future phenomenon of Indian economy. In the past, agriculture was mainly intended for meeting household requirements. The present form of agriculture is rather an improved one which even crosses the territory of national boundary. In the near future, with greater emphasis in this vital field through Five-Year Plans, it could be transformed into an industry which would not only generate more consumable surplus for domestic sector but would also provide surplus for export to a great extent over the present scenario.

Green Revolution (Third Five-Year Plan, 1961-66) and subsequent other development programmes, have brought a rapid change in the agricultural scenario of West Bengal as well as in the district of Nadia. It needs no emphasis that the progress of Indian economy is greatly dependent on the development of agriculture as in India where about 70% of the people are dependent on the produces of the farms, there is need and scope for extension of the utilisation of the costing principles to the farms as well. Therefore, any study on agriculture, particularly on the cost analysis of paddy undoubtedly assumes significance.

2. Objectives

This paper deals with the cost analysis of various paddies of the sample farms. Cost is analysed on the basis of per hectare and per tonne with a view to examine the magnitude of change in unit cost of various paddies over different size-classes of sample farms. The important issues discussed in this paper are as below :

- Magnitude of change in unit cost of different elements of cost among various paddies over different size-classes of sample farms.
- Cost pattern regarding various paddies
- Cost fluctuation among various paddies and the main reason thereof.
- Identification of high and low cost areas.

3. Rationale behind Selection of Nadia District and Sample Design

Nadia is selected with different size-classes of landowners as a field area of

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study. There are a number of specific reasons for such selection. Firstly, it is a multi-crop producing district; paddy and jute are the main crops. Secondly, it is highly dependent on agriculture because of the meagre scope of other employment opportunities. Thirdly, it is neither agriculturally advanced nor backward. Thus, the study on this district would reveal the fair secnario agriculture of West Bengal.

Sample farms are suitably divided as : below 2 hectares, 2 to 4 hectares and 4 and above hectares and these are symbolised as small farms, medium farms and large farms respectively. In order to have a representative character, a sizeable sample is, therefore. drawn from different size-classes of household farms.

Date are collected from primary sources only. In collecting data, door to door survey has been made to the farmers with a structured questionnaire. For measuring fluctuations in cost, coefficient of variation is used.

4. Cost Analysis

The size of production depends on the size-class of farms and other factors of production which, in turn, determines the basis of analysis. To examine the pros and cons as to the differnent sizes of production, it is necessary to classify the sample farms into different size-groups which is mentioned earlier.

Paddy includes boro paddy, aman paddy and aus paddy. Cost analysis for aman and aus paddy is not made separately as the cost structure and yield of these two crops are very highly correlated to each other. Therefore, a composite cost analysis is made for these two identical crops. A cropwise cost analysis of various paddies is given below.

4.1 Boro paddy

Different elements of cost of boro-paddy per hectare for different size-classes of sample farms are tabulated in Table 1.

It is evident that, on an average, direct material cost comes to Rs. 1127.70 per hectare. It however decreases with the rise in the size-class of farms (Table 1).

It reveals that, on an overall basis, direct labour cost is Rs. 7836.35 per hectare. It changes disproportionately with the rise in the size-group of farms which varies from Rs. 7505.35, lowest on the large farms, to Rs. 8034.84, highest on the medium farms (Table 1). It is observed that the use of animal labour is falling while machine labour is rising with the rise in the size-class of farms. It is also observed that the farmers of both small and medium farms are spending more on human labour so that direct labour cost is pushed up. It is interesting to note that human labour cost is about 3.3 times of the composite cost of animal and machine labour. Again, the share of machine labour cost is about 2% of total direct labour cost. Such a lower machine labour cost for producting this vital food crop indicates the existence of traditional agriculture in Nadia district in particular and in West Bengal in general.

It also reveals that, on an average, the share of direct expenses is Rs. 7029.28 per hectare. It declines steadily with the rise in the size-class of farms, giving Rs. 8631.82, Rs. 6473.40 and Rs. 5624.59 per hectare for small, medium and large farms respectively (Table 1). It is noticed that irrigation cost shows an overlapping declining trend whereas the cost of insecticides shows a steady increasing trend with the rise in the size-class of farms. Moreover, irrigation cost in case of small farms clearly explains the situation of not having adequate irrigation infrastructure from the farmers' end or having inadequate government irrigation facilities; rather they have to pay for more to get urgently needed irrigation. The higher expenditure on direct expenses particularly by small farms is attributable to the higher spending on irrigation.

It appears that, on an average, field overhead is Rs. 2270.70 per hectare. It decreases gradually with larger farms (Table 1). Administration overhead, on an average, is Rs. 429.53 per hectare. It declines disproportionately with the rise in the size-class of farms (Table 1). Marketing overhead, on an average, is Rs. 413.77 per hectare. It shows declining trend with larger farms (Table 1).

It shows that, on an overall basis, cost of production comes to Rs. 18693.56 per hectare. It declines steadily with the increase in the size-group of farms (Table 1). Again, total cost per hectare, on an average, is Rs. 19107.33. It decreases significantly with larger farms, showing Rs. 21051.81, Rs. 18707.47 and Rs. 16915.76 per hectare for small, medium and large farms respectively (Table 1). The drop in cost of production and total cost per hectare for larger farms could be explained as the benefit of large scale production.

Table 1 : Per Hectare Comparative Cost Analysis of Boro paddy for the Sample Farms for 1994-95.

(In rupees)

	Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1.	Direct Materials : Seeds	1137.09	1118.41	1131.00	1127.70
2.	Direct Labour :				
	Animal Labour	1761.69	1622.93	1588.81	1663.27
	Human Labour	6030.04	6239.05	5540.14	6009.49
	Machine labour	13.32	172.86	377.03	163.59
		7805.05	8034.84	7505.98	7836.35
3.	Direct Expenses :				
	Irrigation	5030.21	2624.23	1815.63	3274.81
	Fertilisers	3040.70	3124.63	2947.22	3055.68
	Insecticides	560.91	724.54	861.74	698.79
		8631.82	6473.40	5624.59	7029.28
4.	Prime Cost (1+2+3)	17573.96	15626.65	14261.57	15993.33
5.	Field Overhead	2462.80	2305.01	1909.82	2270.70
6.	Field Cost (4+5)	20036.76	17931.66	16171.39	18264.03
7.	Administration Overhead	534.87	371.61	377.97	429.53
8.	Cost of Production (6+7)	20571.63	18303.27	16549.36	18693.56
9.	Marketing Overhead	480.18	404.20	366.40	413.77
10.	Total Cost (8+9)	21051.81	18707.47	16915.76	19107.33

Source : Field survey. Results computed.

Per tonne different elements of cost of boro paddy for different size-classes of sample farms are presented in Table 2.

Table 2 discloses that, on an average, cost of production per tonne is Rs. 3106.24. It decreases significantly with larger farms. Total cost per tonne, on an overall basis, comes to Rs. 3173.90 and it shows a declining trend with the rise in the size-class of farms, showing Rs. 3581.27, Rs. 3077.96 and Rs. 2761.49 for small, medium and large size group of farms respectively. It is observed that per tonne direct labour, direct expenses, field overhead and marketing overhead show proportional decreasing trend while direct materials and administration overhead disclose disproportional declining trend with larger farms. The fall in both cost of production and total cost per tonne in case of larger farms could be attributed as the benefit of large scale production as well as improved yield.

Table 2 : Per Tonne Comparative Cost Analysis of Boro paddy on the Sample Farms for 1994-95.

(In rupees)

Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1. Direct Materials : Seeds	193.43	184.12	184.64	187.39
2. Direct Labour :				
Animal Labour	299.69	267.18	259.38	276.38
Human Labour	1025.79	1027.11	904.43	998.58
Machine labour	2.27	28.46	61.55	27.18
	1327.75	1322.75	1225.36	1302.14
3. Direct Expenses :				
Irrigation	855.71	432.02	296.40	544.16
Fertilisers	517.27	514.40	481.14	507.75
Insecticides	95.42	119.28	140.68	116.12
	1468.40	1065.70	918.22	1168.03
4. Prime Cost (1+2+3)	2989.58	2572.57	2328.22	2657.56
5. Field Overhead	418.96	379.46	311.78	377.31
6. Field Cost (4+5)	3408.54	2952.03	2640.00	3034.87
7. Administration Overhead	90.99	61.18	61.70	71.37
8. Cost of Production (6+7)	3499.53	3013.21	2701.70	3106.24
9. Marketing Overhead	81.74	64.75	59.79	67.66
10. Total Cost (8+9)	3581.96	3077.96	2761.49	3173.90

Source : Field survey. Results computed.

4.2 Aman and Aus Paddy

Per hectare elementwise cost of aman and aus paddy for different size classes of farms are worked out in Table 3.

It is evident that, on an average, cost of direct materials in Rs. 937.62 per hectare. It decreases gradually with the increase in the size class of farms (Table 3).

It appears that, on an overall basis, direct labour cost comes to Rs. 6631.19 per hectare. It declines disproportionally with the increase in the size class of farms which varies from Rs. 6313.06, lowest on the medium farms to Rs. 7007.35, highest on the small farms (Table 3). It is observed that the use of animal labour is falling while machine labour is rising with the increase in the size-class of farms. This indicates a forward-looking symptom towards modern agriculture from traditional agriculture. Again, the rise in direct labour cost is associated with the higher employment of human labour instead of machine labour or use of undesirable labour-mix by the small farms.

It shows that, on an average, cost of direct expenses per hectare comes to Rs. 4398.77. It declines disproportionately with larger farms which varies from Rs. 3429.18, lowers on the medium farms, to Rs. 5390.38, highest on the small farms (Table 3). It is observed that both the cost of fertilisers and insecticides are showing disproportional upward tendency with larger farms. The cost of irrigation is significantly high in case of small farms whereas the cost of insecticides is enough high in case of large farms. The higher direct expenses on the small farms are caused mainly due to the higher expenditure incurred on irrigation which pinpoints the inadequacy of irrigation facilities.

It is evident that, on an average, field overhead per hectare arrives at Rs. 1905.32. It declines steadily with the increase in size-group of farms, giving Rs. 2096.76, Rs. 1785.59 and Rs. 1704.56 per hectare on the small, medium and large farms respectively as revealed by Table 3. The overall administration overhead comes to Rs. 315.32 per hectare on the sample farms which varies from Rs. 195.14, the lowest on the medium farms to Rs. 441.08, the highest on the small farms (Table 3). Marketing overhead, on an average, per hectare is Rs. 245.94. It is ever low, Rs. 224.02 on the medium farms while it is ever high, Rs. 276.34 on the small farms (Table 3).

It shows that, on an average, cost of production is Rs. 14188.22 per hectare. It decreases at a disproportionate rate, which varies from Rs. 12604.34, lowest on the medium farms, to Rs. 15979.95, highest on the small farms (Table 3). Per hectare total cost, on an average, is Rs. 14434.16 on the sample farms. It decreases in the U-shape with the increase in the size-class of farms, giving Rs. 16256.29, Rs. 12828.36 and Rs. 13616.25 per hectare on the small, medium and large size-group of farms respectively (Table 3). The increase in total cost per hectare on the small farms is attributable to the higher expenditure incurred mainly on human labour as well as on irrigation.

Table 3 : Per Hectare Comparative Cost Analysis of Aman and Aus paddy on the Sample Farms for 1994-95.

(In rupees)

	Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1.	Direct Materials : Seeds	1044.38	881.37	801.61	937.62
2.	Direct Labour :				
	Animal Labour	1552.70	1130.64	1168.90	1318.73
	Human Labour	5454.65	4912.94	4742.63	5116.32
	Machine labour	—	269.48	514.74	196.14
		7007.35	6313.06	6426.27	6631.19
3.	Direct Expenses :				
	Irrigation	2735.08	1289.28	1226.28	1900.00
	Fertilisers	2160.27	1722.67	2228.69	1998.54
	Insecticides	495.03	417.23	703.08	500.23
		5390.38	3429.18	4158.31	4398.77
4.	Prime Cost (1+2+3)	13442.11	10623.61	11386.19	11967.58
5.	Field Overhead	2096.76	1785.59	1704.56	1905.32
6.	Field Cost (4+5)	15538.87	12409.20	13090.75	13872.90
7.	Administration Overhead	441.08	195.14	278.42	315.32
8.	Cost of Production (6+7)	15979.95	12604.34	13369.17	14188.22
9.	Marketing Overhead	276.34	224.02	247.08	245.94
10.	Total Cost (8+9)	16256.29	12828.36	13616.25	14434.16

Source : Field survey. Results computed.

Per tonne elementwise cost of aman and aus paddy for different size-classes of sample farms are exhibited in Table 4.

Table 4 shows that, on an overall basis, cost of production per tonne comes to Rs. 3810.50. It decreases steadily with the increase in the size-class of farms. Per tonne total cost, on an average, arrives at Rs. 3876.27. It shows a decreasing trend with the rise in the size-class of farms. It is, however, observed that per tonne direct materials, direct labour, field overhead and marketing overhead exhibit declining trend with larger farms. On the contrary, the behaviour of direct expenses and administration overhead is showing an oscillation in nature. Finally, the fall in cost of production as well as total cost per tonne with larger farms is attributable to the benefit of large scale production and improved yield.

Table 4 : Per Tonne Comparative Cost Analysis of Aman and Aus Paddy on the Sample Farms for 1994-95.

(In rupees)

Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1. Direct Materials : Seeds	280.18	248.18	195.17	251.82
2. Direct Labour :				
Animal Labour	416.54	318.38	284.59	345.17
Human Labour	1463.33	1383.44	1154.70	1374.08
Machine labour	—	75.88	152.33	52.67
	1879.87	1777.70	1564.62	1780.92
3. Direct Expenses :				
Irrigation	733.74	363.05	298.63	510.28
Fertilisers	579.54	485.09	542.63	536.74
Insecticides	132.80	117.48	171.18	134.35
	1446.08	965.62	1012.44	1181.37
4. Prime Cost (1+2+3)	3606.13	2991.50	2772.23	3214.11
5. Field Overhead	562.50	502.81	415.01	511.71
6. Field Cost (4+5)	4168.63	3494.31	3187.24	3725.82
7. Administration Overhead	118.33	54.95	67.79	84.68
8. Cost of Production (6+7)	4286.96	3549.26	3255.03	3810.50
9. Marketing Overhead	74.10	63.04	60.12	65.77
10. Total Cost (8+9)	4361.06	3612.30	3315.15	3876.27

Source : Field survey. Results computed.

5. Cost Pattern

In this section, an attempt is made to derive cost pattern of boro paddy and aman and aus paddy separately. The aim of deriving cost pattern separately of both the crops, is to observe whether there is any similarity or otherwise between the two crops.

What does the cost pattern convery? Simply, it is the behaviour of cost over different levels of production. As we know the multi-dimensional behaviour of cost, cost pattern may be termed as the changing behaviour of cost accompanied by the change in the levels of production. Cropwise cost pattern of crops is designed in the following paragraphs.

5.1 Boro Paddy

The break up of different components of cost and coefficient of variation of boro paddy for different size-classes of farms are tabulated in Table 5.

Table 5 : Comparative Cost Pattern and Coefficient of Variation of Boro Paddy on the Sample Farms for 1994-95 (Percentage)

	Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1.	Direct Materials	5.40	5.98	6.69	5.90
2.	Direct Labour	37.08	42.98	44.37	41.03
3.	Direct Expenses	41.00	34.62	33.25	36.80
4.	Prime Cost (1+2+3)	83.48	83.58	84.31	83.73
5.	Field Overhead	11.70	12.33	11.29	11.89
6.	Field Cost (4+5)	95.18	95.91	95.60	95.62
7.	Administration Overhead	2.54	1.99	2.23	2.25
8.	Cost of Production (6+7)	97.72	97.90	97.83	97.87
9.	Marketing Overhead	2.28	2.10	2.17	2.13
10.	Total Cost (8+9)	100.00	100.00	100.00	100.00
11.	Coefficient of Variation	21.24	19.43	18.86	22.42

Source : Field survey. Results computed.

The cost pattern of boro paddy among different ingredients of cost displays that, on an average, the highest cost is incurred on direct labour, it being 41.03% of total cost, followed by 36.80% on direct expenses, 11.89% on field overhead, 5.90% on direct materials, 2.25% on administration overhead and 2.13% on marketing overhead (Table 5). It is, however, observed that direct labour cost is rising gradually with rise in the size-class of farms. This indicates that larger farms are depending more on human labour in particular and total labour force in general. It is further observed that the cost of direct expenses is declining with larger farms. This indicates that larger farms are, however, getting the benefit of large scale production as well as exercising some sort of control over different items of direct expenses. Other elements of cost, in fact, varies disproportionately with the rise in the size-group of farms.

It reveals that, on an overall basis, the rate of fluctuation (measured by coefficient of variation)[1] of cost of production of this vital food crop is 22.42% on the sample farms. It declines gradually with larger farms, showing 21.24% 19.43% and 18.86% on the small, medium and large size-group of farms respectively as revealed by Table 5. The greater the rate of fluctuation, the greater is the degree of inconsistency in cost pattern. It is noticed that the degree of fluctuation over different size-classes of farms do not vary significantly among themselves. The emerging cost pattern is that the larger the size-group of farms, the greater is the degree of consistency.

5.2 Aman and Aus Paddy

The cost break up and coefficient of variation^2 of aman and aus paddy for different size-classes of farms are presented in Table 6.

The break up of cost of aman & aus-paddy reveals that, on an average, direct labour cost accounts for highest proportion, showing 45.94% of total cost, followed by direct expenses 30.48%, field overhead 13.20%, direct materials 6.50%, administration overhead 2.18% and marketing overhead 1.70% (Table 6). It is noticed that the proportion of direct labour is rising disproportionately with larger farms. This indicates that larger farms are, however, banking more on hired human labour in order to complete the process of cultivation in time. It is further noticed that the share of direct expenses is declining disproportionately with larger size-group of farms. This indicates that the larger farms are using different items of direct expenses in a planned manner with enable minimisation of wastages and losses. The proportion of direct materials and administration overhead is falling disproportionately with larger farms. The marketing overhead is, however, increasing marginally with larger farms.

Table 6 : Comparative Cost Pattern and Coefficient of Variation of Aman and Aus Paddy on the Sample Farms for 1994-95 (Percentage)

	Particulars	Small Farms	Medium Farms	Large Farms	All Farms
1.	Direct Materials	6.42	6.87	5.89	6.50
2.	Direct Labour	43.11	49.21	47.19	45.94
3.	Direct Expenses	33.16	26.73	30.54	30.48
4.	Prime Cost (1+2+3)	82.69	82.81	83.62	82.92
5.	Field Overhead	12.90	13.92	12.52	13.20
6.	Field Cost (4+5)	95.59	96.73	96.14	96.12
7.	Administration Overhead	2.71	1.52	2.05	2.18
8.	Cost of Production (6+7)	98.30	98.25	98.19	98.30
9.	Marketing Overhead	1.70	1.75	1.81	1.70
10.	Total Cost (8+9)	100.00	100.00	100.00	100.00
11.	Coefficient of Variation	21.06	13.34	12.62	21.21

Source : Field survey. Results computed.

The average rate of fluctuation of cost of production comes to 21.21% on the sample farms. It decreases with larger farms, giving 21.06%, 13.34% and 12.62% on the small, medium and large size-group of farms respectively as disclosed by Table 6. The lower the rate of fluctuation implies the greater the degree of consistency. In spite of variation there is closer consistency or otherwise observed in case of both medium and large size-group of farms because the rate of fluctuation is, however, close the each other.

Table 5 and 6 reveal that, in terms of percentage, the expenditure on direct labour is rising while the expenditure on direct expenses is falling with larger farms for producing different varieties of paddy. This indicates the emerging cost pattern which is labour intensive in Nadia in particular and in West Bengal in general.

We already observed the magnitude of change in unit cost for producing different varieties of paddy on the sample farms as shown by Tables 1,2,3 and 4. Fluctuation in unit cost is inevitable for producing different variests of paddy over different size-groups of farms. Again, cost structure is dependent on many factors, viz. fertility of land and its location, availability of productive resources and their efficient utilisation. difference in yield and above all, the influence of natural agents.

It is evident by Tables 5 and 6 that the rate of fluctuation in cost of production per tonne is about 22% for clutivation of different varieties of paddy on the sample farms. It gives a positive sign of declining trend with the increase in the size-group of farms. Such a moderate degree of fluctuation is well acceptable because natural agents have great influence over the fluctuation of cost. Nevertheless, the main reason of such fluctuation lies in difference in cost structure and in yield.

6. Identification of High and Low Cost Areas

In this section an attempt is made to highlight some cost areas which require special attention with a view to exercising cost control in particular and cost analysis in general.

The success of agriculture as in the case of other economic activities is largely dependent on the proper and efficient utilisation of availble resources. Efficient utilisation of resources not only minimises wastages and losses but it also leads to the minimisation of total cost. To make optimal utilisation of various resources in agriculture, it is highly essential to identify such cost areas which absorb highest proportion of total cost. In identifying high cost areas, overall distribution of total cost and its break up for producing different varieties of paddy are tabulated in Table 7.

The elementwise analysis of total cost of different varieties of paddy shows that direct labour accounts for highest proportion. It being 42.92% of total cost, followed by direct expenses 34.37%, field overhead 12.39%, direct materials 6.13%, administration overhead 2.23% and marketing overhead 1.96% (Table 7). Tha analysis of cost has been made separately for boro paddy and aman and aus paddy with a view to finding the difference or otherwise with respect to high and low cost areas. The distribution of total cost into different elements of boro paddy shows that highest cost proportion is incurred on direct labour, 41.03% of total cost, followed by direct expenses 36.80%, field overhead 11.89%, direct material 5.90%, administration overhead 2.25% and marketing overhead 2.13% as revealed by Table 7. Again, the elementwise analysis of total cost of aman and aus paddy exhibits that highest portion of total cost is abosorbed by direct labour, 45.94% of total cost, followed by direct expenses 30.48%, field overhead 13.20%, direct materials 6.50%, administration overhead 2.18% and marketing overhead 1.70% (Table 7).

It is observed that breaking the analysis into boro padddy and aman and aus paddy, the position of cost absorbing ingredient does not change. It is also observed that direct labour is predominant in agriculture. The next highest cost element is direct expenses. So they are regarded as high cost areas.

Table 7 : Comparative Cost Pattern and Coefficient of Variation of Aman and Aus paddy on the Sample Farms for 1994-95 (Percentage)

	Particulars	Boro Paddy	Aman and aus paddy	Total
1.	Direct Materials	5.90	6.50	6.13
2.	Direct Labour	41.03	45.94	42.92
3.	Direct Expenses	36.80	30.48	34.37
4.	Prime Cost (1+2+3)	83.73	82.92	83.42
5.	Field Overhead	11.89	13.20	12.39
6.	Field Cost (4+5)	95.62	96.12	95.81
7.	Administration Overhead	2.25	2.18	2.23
8.	Cost of Production (6+7)	97.87	98.30	98.04
9.	Marketing Overhead	2.13	1.70	1.96
10.	Total Cost (8+9)	100.00	100.00	100.00

Source : Field survey. Results computed.

7. Findings

Some of the major findings are listed below :

1. By sketching cropwise cost analysis on the basis of per hectare and per tonne, the study highlights the magnitude of change in unit cost over different size-groups of farms. It discloses that larger farms are, as compared with smaller ones, deriving the benefit of large scale production (Tables 1,2,3 and 4).
2. Smaller farms are, as compared with larger ones, spending more on irrigation. So, they have to depend more on private irrigation which increase costs (Tables 1,2,3 and 4).
3. The study reveals that the expenditure on direct labour is rising while the expenditure on direct expenses is falling with larger farms (Tables 5 and 6). This indicates that larger farms are, as compared with smaller ones, banking more on human labour as well as exercising some sort of control over various elements of direct expenses.
4. It shows that the fluctuation in cost of production (measured by coefficient of variation) is about 22% on the sample farms for producing different varieties of paddy. It gives a positive sign of decreasing tendency with larger farms (Tables 5 and 6). This indicates that the larger farms are, as compared with smaller ones, efficient in allocating and utilising available rerurces. Nevertheless, such a moderate degree of fluctuation is well acceptable because natural agents have great influence over the fluctuation of costs.

5. Direct labour absorbs 42.92% of total cost, followed by direct expenses 34.37% (Table 7). These two jointly represent 77.29% of total cost. Thus, both the direct labour and direct expenses are identified as high cost areas.
6. Lower expenditure on machine labour irrespective of the size-group of farms indicates the existence of traditional agriculture in Nadia district in particular and in West Bengal in general.

NOTES

1. It is pertinent to note that calcultions for Arithmetic Mean ($\bar{x}$), Standard Deviation (σ) ana Coefficient of Variation (C.V.) are based on per quintal cost of production for cultivation of different varieties of paddy. Coefficient of variation on the basis of cost of production per quintal and per tonne will be same because change of scale from cost of production per quintal to cost of production per tonne will affect both $\bar{x}$ and σ in the same proportion. As a result, coefficient of variation will remain unchanged in case of per tonne cost of production too.

Values of $\bar{x}$ and σ on the basis of cost of production per quintal for different size-classes on the sample farms are given in table below :

Per Quintal Size-classwise $\bar{x}$ and σ on the Sample Farms for 1994-95

(In rupees)

Particulars	Small Farms	Medium Farms	Large Farms	All Farms
Boro Paddy :				
$\bar{x}$	349.50	304.13	270.05	311.81
σ	74.32	59.08	50.94	69.92
Aman & aus-paddy :				
$\bar{x}$	428.73	354.84	324.55	380.85
σ	90.31	47.33	40.96	80.79

Source : Field survey. Results computed.

2. See note 1 for detailed computation of coefficient of variation.

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VENTURE CAPITAL REFORMS FOR IT-SOFTWARE ENTREPRENEURS

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Abstract : This paper discusses the nature of venture capital financing in the high-tech era. In the era of information technology and software development the Indian economy is witnessing a tremendous growth in the IT-enabled services and software development with the intensification of venture capital investment activities in the process of effective deployment of intellectual capital and gearing up to face new challenges with sustainable entrepreneurship development. In India, the venture capital activities, in the process of development of technology-based entrepreneurship, have been initiated in recent times through some venture capital entities. Venture capital very well supports intellectual capitalism. Entrepreneurship development by means of effective venture capital investment activities is nothing new in the history of Indian economic development. In the pre-independence era in the history of Indian socio-economic development, managing agency system created traditional informal venture capitalism and entrepreneurship development in the traditional industrial sector.

Apart from the formal venture capital investments activities in recent times, traditional informal venture capital has been playing an important role in the economic development. The core focus of this paper is on the emerging structural aspects and regulatory framework for the venture capital entities.

Key Words : Formal Venture Capital, Informal Venture Capital, and Regulatory Framework.

1. Introduction

The present form of venture capital financing in India and other countries are following the path of the US, the leader in this field. The Indian venture capital investment activities have significantly changed since 1988, following the concepts of the US venture capital financing. At the end of 20th century, formal venture capital has emerged as new concept of institutionalisation of risk financing for the start-up ventures. Venture capital includes all private equity involving seed stage, start-up, buy-out, growth stage and mezzanine financing. Venture capital financing involves investments primarily based on creative and relatively new technology with unproven rack record, entailing high risk but having high potentiality. Venture fapital, which is invested in stocks, especially in new issues of a new corporation, is called risk capital. Degree of risk at different stages of venture development differs at a considerable extent. For the start-up high-tech ventures at the seed stage, venture capital is indispensable.

In India, the modern concept of venture capital financing has become significant in the era of IT-enabled services, software development and biotechnology. In fact, venture capital financing has already found a foothold into the new millennium. The structural aspects and regulatory framework for governing venture capital investment activities in the process of sustainable entrepreneurship development have become an emerging area of debate and discussion. The rest of the paper is organised to

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focus on the emerging area of debate and discussion. The rest of the paper is organised to focus on the emerging issue in nine sections. Section 2 states a brief history of entrepreneurship development in India by traditional informal venture capitalists; Section 3 discusses the role of formal venture capitalists as well as of the informal venture capitalists ; Section 4, discusses the possible ways in which "venture capital" can be interpreted ; Section 5 gives the structure of the venture capital organizations ; Section 6 reveals the venture capital structure, guidelines, and regulatory framework in the Indian scenario ; and Section 7 offers concluding observations and suggestions.

2. A brief history of entrepreneurship development in India

During the period (1820-1988), there was no formal concept of venture capital financing in the process of entrepreneurship development in the history of Indian economic development. But the origin of traditional informal venture capitalism can be traced back to pre-independence era when the British rules stepped on our soil. Prior to 1840s, there was no scene of industrial entrepreneurship development in India. Indian jute became the most significant industrial product in the 1840s. The jute was required for cheap bagging and wrapping commodities for transportation purposes. During 1840-1970 mechanical innovations created some industrial entrepreneurship based on jute and till 1870 Dundee mills had an almost monopoly regarding jute cloth trading. The expanding foreign demand augmented the importance of raw jute exports from Bengal. Simultaneously the domestic demand for jute cloth was also rising. The expanding opportunities in jute cloth trading attracted an English entrepreneur to set up a small jute-spinning mill in Calcutta in 1855. This entrepreneur's business activities attracted four other British trading enterprises, in Calcutta to set up integrated spinning and weaving mills during 1859-1866. Indian trading entrepreneurs were also attracted into this industry and this industry flourished to a great extent in the early 1870s. The jute industry was basically initiated, managed and controlled by Englishmen/Scots until World War I. A few firms were floated as sterling ventures. The sterling ventures companies got their initial risk capital in the United Kingdom but they offered block of shares to sell in India. Rupee companies tended to collect their initial risk capital in India.

In the early part of the 19th century the Indian cotton textile industry flourished despite foreign dominance. During the first half of the 19th century, Calcutta and Bombay were the hubs of entrepreneurship development in India. The Indian entrepreneurs were then engaged in the development of jute and textile industries. The absolute amount of risk capital need for these industries was mobilized through the ordinary network of personal and commercial relationships with the merchants and managing agents.

The Indian entrepreneurship development was basically based on tea plantation, collieries, jute pressing and clothing mills, oil mills, printing presses, indigo plantation, mica mines, cotton spinning and weaving, flour and rice mills, railway workshops, manganese mines, coffee plantations, etc. The European, Anglo-Indian and American entrepreneurs were dominating over the Indian entrepreneurs in the process of industrial development in the pre-independence period. The Indian managing agents were dominating over the Europeans and Anglo Indians with respect to their managing and controlling capabilities. The enterprises, which were managed by the European and Anglo Indian managing agents, were 1467 in number. The enterprises, which were managed by the Indian managing agents, were 1694 in number.

The Parsis were very enterprising in their activities. The Parsis controlled a majority of Indian enterprises, particularly in cotton mills. The Parsis lead over the Vanis in the management of cotton mills was particularly due to their lead in general education, particularly in technical education over the other communities (Morris, 1979). Bombay got another extraordinary feat of entrepreneurship owing to Tatas in the development of the Tata Iron and Steel Company (TISCO) and in the promotion and management of the hydroelectric works to supply electric power at cheap rates. Indians were gradually attracted to enterprises, which the Europeans discarded as too risky, e.g., rice mills, oil mills, cotton and jute factories for pressing, ginning and weaving, small collieries and transportation by river and others.

The local informal venture capitalists supplied the needed risk capital/venture capital. Indian entrepreneurs were more enterprise-oriented and were continually starting new industrial ventures in a small way. But most of the industrial ventures seemed to fail sooner or later owing to bad management and there was crisis of more and more venture capital. Commercial facilities were not satisfactorily adequate in India in the second half of the 19th century. Still the Bombay entrepreneurs were much more courageous to enter into the manufacturing activities compared to other native entrepreneurs including Bengal entrepreneurs. The native venture capitalists suffered from generalised discrimination by the European entrepreneurs and the European jute manufacturers who made both entry and survival for the Indian entrepreneurs next to impossible by combing as a group. Indians were structurally unable to co-operate in group efforts as Britons found it culturally easy to co-operate to bring the monopolistic agreements in the jute industry but failed in the cotton textile industry.

The different geographical location of the two industries is self-explanatory for the differences in behaviour. The cotton textile industry is spread all over India while jute industry was basically concentrated in Calcutta. The cultural discrimination against native entrepreneurs who sought to enter the industry was the unavoidable factor behind the gradual failures of the jute industry in India. Another most important factor was the rate of return that contributed much in the textile industry compared to jute industry. The Indian jute entrepreneurs were to bear extra risks and uncertainties, as the bulk of the jute industry's market was mainly overseas where the Indian merchants did not develop longterm expertise.

In spite of these constraints the Marwari entrepreneurs played the substantial role by expanding their risk capital investments to penetrate into the jute-manufacturing sector before 1914. The European risk capital investors had a tendency to make investments mainly in the export-oriented sectors while Indian risk capital investors were inclined to make investments in domestic market-based enterprises. For obvious reasons the European investors always earned higher rate of return on their investments, which did not help much to grow the Indian economy with a desirable growth rate. The European investors could calculate better the opportunity costs compared to the Indian venture capitalists with regard to their risk capital investment.

Another important sector, Indian Railways where modern technology was primarily introduced by the European investors who had access to the Indian Railways shares from very beginning. There were a number of entrepreneurial ventures before 1870 for the Indian railways, which sought to produce iron on a large scale. The European entrepreneurs attempted to change the iron-making process without modernizing it at all. They were typically intended to sell the products in the overseas markets.

In 1874, the Bengal Iron Works Company came forward to design the plant in modern lines to take the advantage of high cost of imports and growing domestic demand. The venture was closed in 1879 owing to managerial inefficiencies. The Government of India bought the defunct enterprise and operated it as a public enterprise till 1889 when an etremely knowledgeable group of enterprising directors formed Bengal Iron and Steel Company known as (BISCO). The BISCO received a considerable support from the Indian Government ; nevertheless the BISCO had to close down within a very short period. After that, the success of Tata Iron and Steel Company (TISCO) was a tremendous entrepreneurial achievement. Tata is legendary amongst the Indian entrepreneurial magnets. Tatas invested $35000 as venture capital investment in the initial stage out of their own sources. The Tatas are ever respected as world famous entrepreneurs.

There was a need to create a supportive environment particularly where banking facilities were not at all adequate and capital markets were not active. Entrepreneurship in different industrial fields was felt necessary but industrial venture capital was not adequate. An entrepreneur had to mobilize resources from many sources and this depended largely on personal and intimate business connections. This was the reason for which ventures in the private sector had to make use of the localised capital and the majority of shares were always concentred in the hands of a very small number of people including the managing agents. In an enterprise where necessary venture capital need or tended to be in short supply, the managing agents had major responsibility to manage the needed capital. They were serving as traditional informal venture capital providers having some specific controlling interests. The managing agents, who were very achievement-oriented, had many business connections and market reputations for which could easily arrange the needed amount of venture capital in the case of urgency. The successful managing agents were acceptable to the banks and were able to offer guarantee on many occasions. The creditworthiness was the major asset of managing agents. The small business entrepreneurs had to manage their capital requirements out of their own sources.

The managing agents, besides the oligarchic attitude created traditional informal venture capitalism by mobilizing necessary amount of risk capital investments in different fields. But the managing agents could not launch ventures of unproven track records adopting new technology/untried production processes at that time. The managing agency system acted as a device to loot and plunder the shareholders' wealth (Morris, 1979). Still the entrepreneurship development was under the umbrella of managing agency system that was a unique technique for providing annuities for members of the extended family to whom a managing agent had a special obligation of used funds (Ray, 1994). It would be foolhardy to deny the important role of colonial managing agencies in shaping the process of industrialisation in India. The managing agents were venture capitalists in disguise of directors/managers. Of course, those venture capital investments were necessary at that period to accelerate the pace of economic development.

The form of venture capital investments in the era of managing agency system must not be confused with the modern concept of venture capital financing. The modern concept of venture capital financing in India and all over world is significant in the era of IT-enabled services, software development and in biotechnology. As noted earlier the US has achieved tremendous economic development through the venture capital investment activities in the knowledge-based industries.

Enthused by science and technology and the strident technocratic nationalism of Acharya Prafulla Chandra Ray, Bengal got a pioneering venture as "Bengal Chemicals", which was specializing in drugs and pharmacy products. Calcutta Chemicals was producing soap, toothpaste, and herbal cosmetics. Bengal Lamp was producing electric bulbs and Bengal Immunity was producing vaccines and other preventive medicines. Sir Jagadish Chandra Bose and Acharya Prafulla Chandra Ray founded Bengal Chemicals. A person no less than Sri Rajshekhar Bose managed its golden period of growth. Sri Kiran Shankar Roy, a wealthy Oxford-educated zamindar, set up Bengal Lamps. The Bengal Pottery Works owned by Sri Manindra Chandra Nundy, the Maharaja of Kasimbazar. Calcutta Chemicals was owned by two Bengali families, the Mitras and Dasguptas, who brought the new technology from England to produce cosmetics and soaps. In addition to these, there were many collieries in Bengal and tea gardens in Assam (Dooars) owned by Bengali Babus. The Dutta Family founded the Comilla Bank in East Bengal. So the Bengali financial entrepreneur had also made a modest attempt in banking and financial reforms. Bengali entrepreneurs had great interest in newspaper publishing. In 1910, the Sarkar family owned the Ananda Bazar Group and the Ghosh family owned the Amrita Bazar Patrika, Jugantar, and Basumati Groups. The British recognised these newspaper entrepreneurs as fountainheads of radical political thought.

The Bengali entrepreneurs were very enterprising but gradually ruined due to their elite culture and babuanas. Their inept management, style of running business, squabbling and squandering between the family partners paved the way for entry of other community entrepreeurs. Most of the Bengali owned enterprises were specialized in technologically innovated products that demanded constant upgrading, modernisation and diversification.

The Bengali entrepreneurs owned the technology-based enterprises, which could grow as fast as expected but could not do so as all profits were virtually declared as dividends as a result of which the ploughing back of profits for the purpose of renovation and modernisation were almost nil. The other option of issuing fresh equity shares to the general public was rarely used out of fear that outsiders would come to control the economy. The expansion of the Bengali owned enterprises was only dependent on allowance of bank loans and debentures. However, every successive loan raised the debt-equity ratio. The banks refused further advances. Most of the Bengali owned enterprises faced severe capital crisis in 1930s when the equity values got reduced drastically.

An equally serious threat was created due to the emergence of multinational companies (MNCs), who generally opted for the important products, e.g., soap, pharmaceutical products, electric appliances, vaccines, toothpastes and many other new products of that period. The MNCs grew fast due to their high scale economics, low-cost technologies, greater amount of risk capital deployment, and large market development strategies. Lever Brothers, who had already captured a sizeable segment of the Indian soap market, was going further expansion. Bengal Lamps was being swamped. first by General Electric Company and then by Dutch-based Philips (India) Limited, Kolay and Sons had to compete with Britania Biscuit Company, Calcutta Chemicals was competing with Colgate Palmolive in the market of toothpaste.

Significantly, the Bengali entrepreneurs had very aptly taken up enterprising activities to introduce new products for untapped domestic market in the early part of the 19th Centuty. But most of the enterprises had to compete with the MNCs. The MNCs pumped a huge amount of venture capital/risk capital into the consumer goods marketing. An illustrative list of MNCs in India during the period (1908-48) represents for quick appraisal of inflow of foreign venture capital/risk capital funds in Table 1.

All these multinational companies invested Rs. 192.4 million venture capital/ risk capital funds to cater exclusively to the domestic market. The domestic market in India was really starved of consumable products. To satisfy the domestic market needs the entry of MNCs into the Indian product market was highly relevant from the standpoint of demand side as well as the supply side. India was then an abysmally poor country that could hardly meet the domestic demand for essential goods. At that period the MNCs in India created their own marketing network.

By the mid 1950s the MNCs had entered almost all major industries, viz., chemicals, pharmaceuticals, baby foods, toothpaste, soap, cosmetics, cooking mediums, cigarettes, tea, coffee, petroleum products and its by-products, gases, engineering goods etc. etc. The MNCs were mainly the British. The profits of the British MNCs in India were 120% of the world average (Ray, 1994). The massive foreign venture capital investment activities made by the MNCs in India created novel marketing methods for the standardized consumer products. The Lever's experience regarding soap and toiletries was remarkable. Brook Bond did a sound

TABLE 1

The Inflow of Foreign Venture Capital/Risk Capital Funds in India (1908-48)

Parent Company	Subsidiary Company	Year	Venture Capital Risk Capital (Rs. Lakh)	Activity
AEI	AEI (India) Limited	1924	25	Electrical Engineering
	AEI Manufacturing Co. Ltd.	1939	25	-do-
Alfred Herbert	Alfred Herbert India	1919	25	Machine Tool
Babcock & Wilcox	Babcock & Wilcox	1947	25	Boilers
Braithwaite	Braithwaite (India) Ltd.	1930	39	Mechanical Engineering
British Oxygen	Indian Oxygen	1935	93	Industrial Gas
Cadbury Fry	Cadbury (India) Ltd.	1948	13	Cocoa Products
Chloride	Chloride and Exide	1947	15	Batteries
Crompton Parkinson	Crompton Greaves	1937	50	Electrical Equipment
	Greaves Cotton	1937	25	Electrical Equipment
Dunlop Rubber	Dunlop (India) Ltd.	1926	170	Tyres
GEC	GEC (India) Ltd.	1911	50	Electrical Equipments
GKW	Guest Keen Williams	1931	141	Railway Equipments
Godfrey	Godfrey Philips (India)	1936	70	Tobacco
Goodlass Wail Ltd.	Goodlass Wall Ltd.	1933	25	Paints
ICI	Alkali & Chemical Corporation	1937	93	Chemicals
Imperial Tobacco	Imperial Tobacco	1908	461	Tobaco
J. Stone	J. Stone & Co. Ltd.	1931	27	Engineering
Jenson & Nicholson	Jenson & Nicholson Ltd.	1922	33	Paints
Metal Box	Metal Box (India) Ltd.	1933	105	Containers
Philips	Philips (India) Ltd.	1931	35	Electrical Equipments
Tuner Newall	Asbestos Cement Company	1934	60	Asbestos
Westing House Brake	Saxby & Farmer	1923	25	Railway Equipments
Unilever	Lever Brothers	1931	88	Soap
	Hindusthan Banaspati	1934	105	Vegetable Oil
Union Carbide	Union Carbide (India)	1934	101	Batteries
TOTAL			1924	—

Source : Tomlinson. 1978

marketing structure in India. ICI recorded a spectacular success. Metal Box supplied containers to the three petroleum companies. During the 1950s the MNCs played a vital role in India. In fact, the three oil companies made huge profits to set up massive refineries in the 1950s, Shell and Esso at Trombay in 1954 and Caltax at Visakhapatnam in 1957.

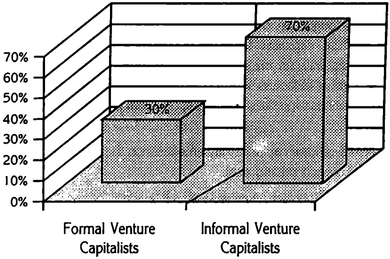
Given such a rich diversity of activities in the industrial fields, the MNCs and managing agency system had played a definite key role to boost up the entrepreneurial spirit in India with the deployment of venture capital/risk capital. The role of informal venture capitalists was astounding in India. During 1950-88, there were financial reforms through the leading financial institutions and development banks (viz., IDBI, ICICI, UTI, SFCs, and others). The manufacturing, agricultural, and other industrial activities were flourished in a major way. Indian industrial enterprises have utilized four basic factors of production (e.g., land, labour, capital and organisation) optimally to maximize domestic customers' satisfaction and national economic progress. Capital, raw materials, land and labour are not the only factors of production to accelerate the pace of economic development. A more critical and crucial factor the domination of information technology. Information Technology (IT) related software development is the engine that presently drives the economies of nations. The hardware industry needs to develop, marrying with IT. The economic strength now primarily lies in technological innovations. Countries with obsolete technology and obsolescent production cannot gear up to accept the global competitive challenges.

Modern technology is absolutely knowledge-based. Knowledge capital[1] is the key to success. This is an era of knowledge capitalism, which is very much compatible with venture capitalism. Knowledge capitalism is functionally dependent on the availability of knowledge workers[2], while venture capitalism rests on the availability of venture capitalists. Venture capitalists are broadly classified into two distinct groups. The first group comprises the formal venture capitalists (i.e., institutionalised venture capital funds). The second group comprises the informal venture capitalists (i.e., non-institutionalised venture capital funds). The informal venture capitalists are called "angel investors"[3]. Venture capitalists often relate to the story of Christopher Columbus. The modern venture capital began in the post World War II. The founder of American Research and Development Corporation (ARD), formed in 1946, was General Georges Doroit, a French-born military man and professor of Harvard Business School who is called as "the father of venture capital". The first orgins of modern venture capital in India can be traced to the setting up of a Technology Development Fund (TDF) in 1987-88.

The role of informal venture capitalists is significant in the era of information technology. The risky start-up ventures with innovative technology cannot start operations even at the seed stage without having venture capital finance from the angel investors.

CHART 1

DECOMPOSITION OF VENTURE CAPITALISTS



Source : Field Survey, 2000-2001

In the new millennium, the IT and biotechnology will be able to contribute a meaningful discourse in the need of venture capitalists' appearance. Of course, venture capital financing in India is neither novel nor new. This sort of risk financing has existed for decades in Indian entrepreneurship development. But the forms of venture capital financing are being changed since 1988 in the light of the US venture capital concept.

3. The Role of Formal and Informal Venture Capitalists

Most new start-up risky ventures with innovative technology lack assets that differentiate them from their competitors. They take business risks but do not really earn profit. They merely provide a wage to their proprietors who have taken up business risks by their own means. The profitability of their ventures is difficult to estimate; small ventures often keep untidy financial records. But the capacity of small ventures to finance high rates of growth through the internally generated funds suggests that their profit margins were significantly positive (Bhide, 2000). Financing of new ventures in the process of entrepreneurship development can be managed from personal sources, wealthy individuals (angel investors), equity sources, internally generated funds, private placement of equities, and initial public offerings (IPOs). Equity is capital invested in venture by its owners, which is at "risk" on a perpetual basis. It creates no obligation on behalf of entrepreneur to repay investors. But raising equity means sharing of ownership. The informal venture capitalists seldom engage in stringent deals/complex investment analysis while the formal venture capitalists cannot come forward without stringent done deals. At the seed stage and start-up stage the risky ventures can seldom score the pass mark to obtain formal venture capital finance. The formal venture capitalists' funding supports are only made available through the stringent done deals (i.e., pricing a deal for a judicious investment decision). The formal venture capitalists have standard terms for providing finance to enterprises (Verma, 1997). The terms and conditions differ in accordance with the stages of development for which venture capital finance is sought. So, there is always a negotiation between an entrepreneur and formal venture capitalist for each deal strategically. The formal venture capitalists lay emphasis on the choice of an appropriate capital structure, which depends on a number of factors such as the nature of business, regularity of revenue earnings, new business mission, new entrepreneurial capability, new management team, etc.

The formal venture capitalists lay emphasis on the following elements, which are significant for each pricing deal.

1. Compound current revenue level = $R(1 + g)^n$
2. Post-tax return for n years = $R(1 + g)^n (\alpha)$
3. ** Market Valuation of the enterprise/company = $R(1 + g)^n (\alpha)(\beta)$ at the time of exit.
4. Present Value Factor = $(1 + d)^n$
5. $*V = \dfrac{R(1+g)^n(\alpha)(\beta)}{(1+d)^n}$
6. $M = \dfrac{(1+g)^n(\alpha)(\beta)}{(1+d)^n}$
7. $*V = (R)(M)$

Where, g stands for growth rate;

n stands for number of years between initial investment and exit date;

α stands for expected profit margin (post-tax) percentage at the exit date;

β stands for expected price-earning ratio at the exit date ;

d stands for appropriate discount rate for venture capital investment and undertaking risk;

R stands for current revenue level ;

*V stands for present value of the enterprise/company;

M stands for revenue multiplier.

The involvement of formal venture capitalists' funds is determined in the light of funds requirements, availability of exit routes and required ownership. The required ownership is computed as follows.

Minimum required formal venture capitalists' share in ownership

$$= \frac{\text{Required venture capital}}{\text{*PV of the enterprise/Company}}$$

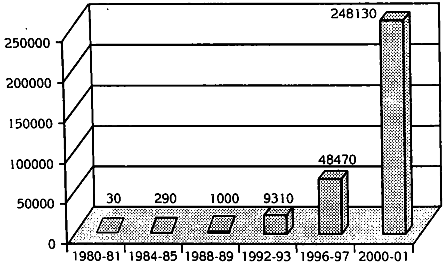
The key considerations, on the basis of government guidelines, to sanction venture capital for any project are new technology, new entrepreneur, and entirely new project using technology by the first generation entrepreneur. In India, the project appraisal is done very carefully with respect to entrepreneurial capability, genius and resourcefulness, the technical skills and managerial traits of the entrepreneur. The professional experts are engaged in the process of appraisal of entrepreneurial projects through a stringent screening and techno-economic evaluation.

The informal venture capitalists do not pay much emphasis on such due diligence rather they always assume high volume of business risks by providing venture capital finance at the seed stage, start-up stage and also in the expansion stage. They always prefer to take high n-achievers having creative ideas involving with unpredictable risks and uncertainties. Most of the newly formed hi-tech ventures obtain their venture capital financing from the informal venture capitalists. The angel investors represent the largest primary source of venture capital finance for both seed and start-up hi-tech ventures.

Indian software entrepreneurs are raising funds from venture capital and angel investors. It is a great achievement on the part of Indian software entrepreneurs who are reaping increasing levels of venture capital in the US, with $2.85 billion already raised over the past 15 months. At the same time fund managers here have begun to scour start-ups in India. The rising trend shows that the Indian tech talents stand in the global market particularly in IT-related software development activities. Global angel investors are attracted towards the Indian software talents. After the achievement in risky ventures, the formal venture capitalists actually take courage to make venture capital investments. Most of the formal venture capital investments are post start-up financing. So, the informal venture capitalists/angel investors come forward to give birth to the high value adding ventures. The formal venture capitalists are only fund providers only at the matured stage for venture development. Before giving birth to any risky hi-tech venture to lay emphasis on due diligence is killing of foetus in the womb. Due diligence refers to the process of meticulous investigation regarding the merits of a prospective entrepreneur (viz., qualification, genius and resourcefulness of new hi-tech entrepreneurs, the size, growth of venture, methods of marketing, market potential, existing competition, the soundness of technologies, the management team and others). Informal venture capitalists as well as formal venture capitalists have taken up India as hub of venture capital investments in the IT-software sector. Bar chart 2 represents the software export growth.

CHART 2

INDIAN SOFTWARE EXPORT (Rs. million)

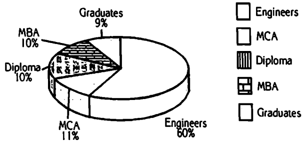


Source : Author's compilation of Dataquest data series and DoE Reports

Indian software export grew at a faster rate, which attracted the prospective venture capitalists' investments in the IT-software development sector. The venture capitalists are toasted as the funding fathers of India's remarkable entrepreneurial revolution owing to the real potential available in technology and knowledge capital. The Indian knowledge workers who have a strong academic base, continuously create the knowledge capital. It is shown in chart 3.

CHART 3

ACADEMIC BASE OF INDIAN KNOWLEDGE WORKERS



Source : Field survey by the anther, 2000-2001

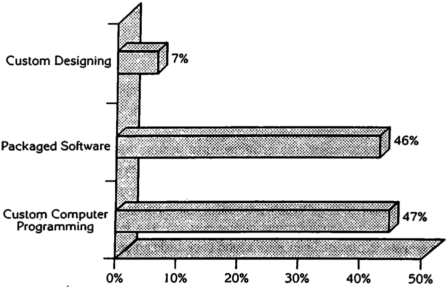
The global need is to accelerate on the knowledge-driven industries like info-tech, healthcare, entertainment and services. During 2000-01 twenty-one venture capitalists from abroad have invested $2188 million in IT-software development sector in India. It is expected that Indian software export will be growing faster than the past years.

The organizational structure of the computer software industry is dominated by private limited companies. More than 70% of the Indian software enterprises are backed by the informal venture capitalists'/angel investors' finance. Private equity is a major component of capital structure of Indian software enterprises at the seed and start-up stage. Thirty-five leading Indian software enterprises have already listed their 110.78 million ordinary shares @Rs. 10/- each through initial public offerings (IPOs) during the last eleven years [i.e., 1990-91 to 2000-01].

The Indian IT-software development sector is creating employment opportunities for 10 million knowledge workers by 2005. The angel investors/informal venture capitalists are playing a key role to boost up the strength of the computer software industry, which can be estimated by its contribution to employment growth for knowledge workers in India. Chart 4 represents employment of knowledge workers in core software industry in India.

CHART 4

EMPLOYMENT OF KNOWLEDGE WORKERS IN CORE SOFTWARE INDUSTRY IN INDIA



Source : Author's compilation from Dataquests Survey Reports and Heeks' estimate, 1996

The major source of employment of knowledge workers in the software industry is related to custom computer programming, which accounts for about 47% of total industry employment. Total employment of knowledge workers in custom computer programming in Indian software industry is 1.85 lakh. The next most significant source of employment of knowledge workers in the software industry is packaged software, which accounts for about 46% of total industry employment [i.e., 0.28 lakh]. However, this estimate attempts to give an idea about employment in the mid 1990s. An estimated national employment of knowledge workers in the software industry was 3.94 lakh in 1990-91.

4. Venture Capital Interpreted :

Venture capital is patient money, which is invested at the seed stage[4] and start-up stage to give birth to the hi-tech entrepreneurial ventures and inclubating new and innovative ideas. Venture capital financing is distinguished from other traditional sources of finance in the modern era on the basis of the following characteristics:

- *Industry is basically technology and knowledge-based.*
- *Unproven technology involves high-risk but highly potential.*
- *The entrepreneur is talented but inexperienced and first-generation drive.*
- *Investment carries high-risk-high-profitability.*
- *Probability of high-loss at the seed and start-up stage is assumed.*

The formal venture capitalists are very shy to accept these characteristics of a new hi-tech entrepreneur while the angel investors are gallant. The venture capital is also interpreted as follows.

1. (a) Venture capital investments are made in an enterprise/company, which has a mission to run the business activities with the innovative technologies/ideas having some inevitable market risk/business risks but high potential to grow.

(b) The business entity has accepted this mission to accelerate the pace for sustainable high-tech entrepreneurship development.

2. At the seed stage when ideas are to be incubated, the entrepreneur needs incubating venture capital fund supports.

3. At the start-up stage when ideas are fertilized and identified with a definite path to grow with certain revenue level, the entrepreneurial venture needs to have venture capitalists' finance.

4. At the expansion stage, the entrepreneurial venture needs venture capitalists' finance to go ahead with diversification of products/services and creation of markets.

5. At the mezzanine[5] state of affairs, the enterprise/firm/company has grown sufficiently and matured enough to go to public for initial public offerings through any regulated stock exchange for equity finance raising purpose. The formal venture capitalists come forward to provide finance for sound book building process. At this stage, the risk of financing is relatively low.

6. At the turnaround stage, the enterprise/firm/company indeed gets formally venture capital finance in need.

7. In cases of management-buy-outs (MBOs) the venture capitalists' finance becomes indispensable to meet the buy-out obligations in accordance with the market-capitalized value. The market-capitalized value depends on the pricing deal/ stringent done deal.

Venture capital investments in hi-tech entrepreneurial ventures that are trying a new idea, new production process, involves different risk perceptions. In the pre-independence era India did not have such hi-risk-hi-tech entrepreneurial ventures that got formal venture capital finance. In the post-independence era Indian hi-tech entrepreneurial talents have attracted many foreign angle investors. Venture capital is an important source of equity for start-up ventures. Venture capitalists generally:

- *finance new and rapidly growing ventures*
- *purchase equity securities*
- *assist in the development of new products or services.*
- *tadd value to the enterprise through active participation in need.*
- *take higher risk with the expectation of higher value-addition and rewards*
- *have a long-term orientation like a patient bird.*

Typically first generation tech-entrepreneurs start such high-risk ventures with the anticipation of high returns. Such tech-entrepreneurs generally do not have major collateral to offer as security; hence banks/financial institutions are averse to funding them. The informal venture capitalists'/angel investors' funding in the equity of the newly set up enterprise or a combination of debt and equity is the most preferred route.

5. The Structure of Venture Capital Organization

The flow of formal venture capital finance needs structured venture capital organizations (VCOs). The structure of VCOs is essentially based on the following.

- *Tax transparency must be given for the investors and investee companies.*
- *Limited liability must be ensured for the investors.*
- *Simple operational bodies of venture capital funds (VCFs) are essential.*
- *The investors must be given tax-friendly environment.*
- *Double-taxation on the basis of two-layers of taxation must be avoided.*
- *The 'carried interest' structure incorporated within the fund must be avoided.*
- *The 'carried interest' structure incorporated within the fund must be given tax-exemption in order to provide incentive fund managers.*

The carried interest. which gives venture capitalists a share of the profits but not of the losses, creates and inestment incentive in excessively risky projects (Bhide, 2000). In India, double layers of taxation prevail at present. In the US and the UK two types of tax effcient structures are practised over the years for the emergence of the venture capital industry. The first type is based on a tax, which is leviable only on the investors (to whom profits are distributed). The second type of taxation involves a limited partnership under which investors are taxed on their share of profits irrespective of the facts of distribution. The VCOs are generally structured in the following forms.

- *A Limited Partnership;*
- *An Offshore Company;*
- *An Offshore Unit Trust;*
- *A Small Business Investment Company (SBIC);*
- *An Investment Trust;*
- *An Investment Company S-Corporation;*
- *An Investment Company C-Corporation;*
- *Direct Investment Plan or A Bare Trust.*

In the venture capital industry "limited partnership" was formed in 1958 that brought about a tremendous success in the US economy. During 1980-90, 80% of the capital committed to venture capital funds went to limited partnership in the US (Gompers

& Lerner, 1999). The limited partnership is the most favoured form of structuring of a venture capital organisation in the US. Th limited partnership in the process of structuring the VCOs in the UK was introduced in May 1987. A limited partnership is attractive in the formation of VCOs because its limited liability feature lures the investors to come forwarded to invest in hi-tech-hi-risk-hi-profit ventures but they do not like to participate in the operation of the fund's business. A limited partnership acts as an engine of the venture capital industry in the US.

An investment company, the S-corporation, having the similar features of a corporation such as limited liability, is treated like a partnership for tax purpose in the US. The limited partnership and S-corporation are most favoured forms for venture capital financing activities in the US due to tax transparency. The profits and losses are directly transferred to the shareholders and chargeable to tax at the shareholders' level. The members of the S-corporation have limited liability and enjoy tax incentives (Ramesh and Gupta, 1995). In addition to the VCOs structured as a limited partnership there may be another entity called the "service corporation" (Gompers, 1994).

The US-based limited partnership structure of venture capital fund includes limited partners who use to provide 99% of capital. They get 80% of profits. The individual fund managers are generally general partners who provide 1% of capital. They get 20% of profits. If there is Service Corporation in the formation of limited partnership structure of VCF, the service corporation gets service fee. In the absence of Service Corporation, the general partners are allowed to get the service fee. The limited partnership enjoys the greatest advantage of tax incentives. The partners get profits transferred in their hands. At the partner's level tax are levied while in the case of a corporate body, the profits are taxed at first at the corporate level and then the distributed profits shall be taxed again at the shareholders' level. In the US, limited partnership firm becomes a tax-exempt entity. Pension funds are completely tax free. The corporate body as the vehicle for a venture capital organisation does not provide adequate tax-friendly investment opportunities for the shareholders.

In the UK, the general partners in a limited partnership have unlimited liability, which is the major disadvantage. The partners are chargeable to tax on gains as and when the investments are disposed off. The fund managers are generally compensated in two ways e.g., in the form of annual management fee and carried interest (Ramesh and Gupta, 1995). An Investment Trust is a public company. In UK, this type of trust has been constituted to run the venture capital investment activities. The shares of the trust are hopefully listed in the stock exchange. The trust enjoys tax transparency regarding its chargeable gains. In UK, VCOs in the form of bare trusts are functioning for approved business expansion schemes since 1983.

Banks under the Small Business Investment Act, 1958 in the US, have set up the SBICs. In the US, the SBICs have been constituted to boost-up banks' participation in the venture capital investment activities for small businesses. Creation of the SBICs and new ventures has become a potential force for the economic development in the US. In 1981, there were only 5, 81, 661 new businesses incorporated in the US. That has gone up to 7,41,657 in 1994 (Gompers, 1999). Gompers has observed that during the 1980s firms with fewer than 500 employees created 322 innovations annually for each million employes while large companies contributed only 225 innovations per million employees. The small firms are much more innovative and enterprising than the large firms in the US. Venture capital financing made by SBICs is the most significant vehicle for small young entrepreneurs. In the US, it is observed that most of the successful ventures have received venture capital finance at their seed and start-up stage, which could accelerate the pace to tremendous economic progress through technological innovations and also created employment opportunities. The US model of venture capital financing activities specially meant for small business entrepreneurs has become a hallmark in the global arena.

6. Venture Capital Structure, Guidelines, and Regulatory Framework in Indian Secnario

In the US, the venture capital network is organised by limited partnership in a major way. In India, the existing laws do not allow to the formation of limited partnership for venture capital organization. The formal venture capital industry is still very shy of being organized enough to gear up and face the new global challenges in the innovative fields of information technology related software development as well as in the healthcare and biotechnology. Of course, a few venture capital organizations (VCOs) are engaged in the venture capital investment activities, which are structured as an investment company, a division of financial institution/bank; a scheme of the Unit Trust of India (UTI); a Unit Trust; Unit Trust of India Software Fund. These structural forms for the emerging venture capital financing in India are not adequate to boost up the tech-entrepreneurship development. Investment company is governed just like a corporate body having shareholders who have limited liability to the extent of their shareholdings. The term "venture capital company" is defined to mean a company, which has made investments by way of acquiring equity shares of venture capital undertakings in accordance with the prescribed guidelines of the Securities and Exchange Board of India (SEBI), 1996. The term "venture capital undertaking" is defined to mean a domestic company whose shares are not listed in a registered stock exchange in India and which is engaged in manufacture or production of articles or things (including computer software) as may be notified by the Central Government. The Finance Act, 1997 has made an amendment (w.e.f. the assessment year 1998-99) to wider the definition of venture capital undertaking to bring within its scope and undertaking engaged in the business of generation and distribution of electricity or any other form of power or engaged in the business of providing telecommunication services. The Finance (no. 2) Act, 1998 has included (from the assessment year 1999-2000 the business of developing, maintaining and operating any infrastructure facility in the aforesaid definition. For this purpose, "infrastructure facility" shall mean road, highways, bridge, airport, post rail systems, water supply, irrigation projects, sanitation and sewerage systems or any other public facility of a similar nature as may be notified by the Board in this behalf in Official Gazette and which fulfils the conditions specified in section 80-IA. The Indus Venture Fund has been constructed in India as a Unit Trust under the Indian Trust Act, 1882. In the Indian venture capital industry the UTI has become a popular name having three venture capital unit schemes e.g., VECAUS-I, VECAUS-II, and VECAUS-III. These venture capital funds have been structured as schemes of the Unit Trust of India, which is exempt from tax under the UTI Act. All the venture capital funds have been floated under the umbrella of the UTI enjoy the benefits of tax exemption. All these floated venture capital funds have been subscribed by the UTI, domestic corporate bodies, and international organizations. The Technology Development and Information Company of India Limited (TDICI) and Risk Capital and Technology Finance Corporation Limited (RCTC) are the fund managers of these UTI funds. The Industrial Development Bank of India (IDBI) has constituted separate venture capital divisions. Small Industries Development Bank of India (SIDBI) has a separate venture capital division. These separate venture capital divisions of Indian lead banks/financial institutions sanction necessary funds to the needs of various virgin fields of venturing in India.

Significantly, it is observed that so far as the regulatory framework vis-a-vis guidelines for venture capital industry in India is concerned the restricted definition of venture capital is being followed in India for the purpose of tax concessions. The guidelines issued by the Central Government on November 25, 1988 and released by the office of the Controller of Capital issues, Department of Company Affairs suggested that the venture capital financing should confine to the enterprises fulfilling the following conditions (Pandey, 1996).

- *Size : Total investment is not exceeding Rs. : 100 million;*
- *Technology : New or relatively untried or very closely held or being taken from pilot to the stage of customisation or incorporating some significant product improvement over the existing ones in India;*
- *Entrepreneur : Relatively inexperienced, new, professionally or technically qualified persons with inadequate resources or backing to finance the venture. However, all these conditions shall not apply if the financial assistance is provided for the revival packages to the sick industrial enterprises. Venture capital excludes financing or enterprises engaged in trading, broking, investment or financial services etc.*

This section aims to give a bird's eye view of the various guidelines a venture fund has to adhere to in India under :

- *The Indian Trust Act, 1882 or the Company Act, 1956 depending on whether the fund is constituted as a trust or a company.*
- *The Foreign Investment Promotion Board (FIPB) and the Reserve Bank of India (RBI) are the appropriate authorities to regulate the foreign venture capital funds/offshore Funds.*
- *The Central Board of Direct Taxes (CBDT) governs the taxation issues on capital gains or proceeds from venture capital funding activities.*
- *The Securities and Exchange Board of India (SEBI) regulates the venture capital funding activities in India under the Regulatory Framework, 1996.*
- *The Department of Electronics forms time to time various taskforces and standing committees under the directives of Government of India, Ministry of Finance.*
- *The National Association of Software and Computers (NASSCOM) keep overall track records regarding growth and future prospects of the industry.*

SEBI Committee [headed by Mr. K. B. Chandrashekar] Report :

In the absence of an organised venture capital market till almost 1988, individual investors and development financial institutions have hitherto played the role of venture capitalists in India. In 1973, a committee on Development of Small and Medium Enterprises highlighted the need to foster venture capital as a source of funding new tech entrepreneurs. Thereafter, some public sector funds were set up but the venture capital investment activity did not gather momentum as the thrust was on high-technology projects funded on purely financial rather than a holistic basis. Later, the World Bank, conducted a study to examine the possibility of developing venture capital in the private sector. Based on the study report of the World Bank, the Government of India took a policy initiative and announced guidelines for venture capital funds (VCFs) in India in 1988. These guidelines restricted setting up of VCFs by the banks or the financial institutions only. Thereafter, the Government of India issued guidelines in September 1995 for overseas investment in venture capital in India. The CBDT and RBI were given powers to regulate the foreign venture capital investments in India. In order to develop the India capital markets, the Securities and Exchange Board of India (SEBI) framed the SEBI (Venture Capital Funds) Regulations, 1996.

The first phase of venture capital reforms as suggested by the SEBI Committee headed by K.B. Chandrashekar has witnessed tremendous achievement. Most of the recommendations of the committee have been accepted. Venture capital investors were active during most part of 2000 in not only raissing funds but also in making investments. Now the time has come to review what should be done to maintain the continuous flow of venture capital in the development sustainable entrepreneurship in India. There are 70 venture capital funds in India, which are actively operating with their focus on effective tech-entrepreneurship development in India particularly in the knowledge-based industries. The total cumulative assets under management would be over $5 billion at the end of 2000 with investments in IT and non-IT sector around $1 billion. This is an increase of over 100% over 1999. Especially in the information technology sector there is a flurry with over 2500 new IT firms being set up in 2000.

7. Concluding obervations and suggestions

It is observed that the tech-entrepreneurs particularly in the IT-related software development activities are high-risk takers and high-achievers. It has been already proved in the US, UK, and other countries that India has huge potential in the IT sector. The foreign venture capitalists are coming India to invest in the IT-related software development activities with most enthusiasm. Indian formal venture capital industry has to develop fast by changing the mindset of the fund managers who are custodian of financial resources in the lead banks/financial institutions in India.

Early stage projects are not getting adequate venture capital finance owing to lack of collateral security specific asset base of the start-up tech-ventures. The lead banks/financial institutions take initiative to invest only in successful expanding ventures as the bankers have little practical technical knowledge. The tech-entrepreneurs are not getting adequate formal venture capital funding support rather the angel investors take initiative to invest in high-profit-high-risk projects.

With the formation of IT ministry, Government of India has taken a major step towards promoting the domestic industry and achieving the full potential of the India IT entrepreneurs. Constraints have been comprehensively identified and steps taken to overcome them by improving IT-friendly infrastructure and also to provide tax incentives. Venture capital has been the main source of finance for software industry around the world. However, majority of the software units in India is in the small and medium enterprise sector and there is a critical shortage of formal venture capital finance. In order to alleviate the situation and to promote India IT-related software industry, the Government of India has set up a National Task Force on IT and Software Development to examine the feasibility of accelerating the growth of software industry. Norms for the operations of venture capital funds have also been liberalized to boost the industry. The Government of India is also actively providing fiscal incentives and liberalizing norms for Foreign Direct Investment (FDI) and raising capital abroad. Recently, The Ministry of Information Technology, Government of India, has set up an IT Committee comprising Non Resident Indian (NRI) professionals from the United States to seek expertise and advice and also to step up US investments in the IT-related software sector of India.

To accelerate the pace of economic growth it can be humbly suggested that the Government of India and the State Governments must change the mindset to promote the growth of human resource development in the IT sector with the aim of creating quality-based education, which will add the pool of knowledge workers. The knowledge workers have brain capital that is most compatible with the venture capital activity. So, intellectual capital/brain capital can be able to accelerate economic growth with an appropriate dose of formal as well as informal venture capital investment in India is rich in today's knowledge economy because she has the second largest English-speaking scientific professionals in the world. It is knowledge industry that will help to accelerate a sustained rate of growth and the policy makers are now aware of this fact.

NOTES

[1] Knowledge capital means brain capital by which knowledge workers continually expand their capacity to create the results they truly desire, to nurture new and innovative ideas, and it is a way of behaving, indeed, a way of being an essential factor of a learning organization (Nonaka, 1991).

[2] Knowledge creating companies where inventing new knowledge is not a specialized activity rather it is a way of behaving, indeed, a way of being, in which every one is a knowledge worker (Nonaka, 1991).

Leadership, in the global competition, needs all important knowledge areas : technology, marketing, organization, management, training and firm control of "brain capital" (Drucker, 1992).

[3] Angel investors are the business magnets (viz., leading doctors, professors, lawyers, and others) who come forward to make investments for the start-up ventures at seed stage with innovative technology (Gompers, 1994). Angels are high net worth individuals who provide seed money.

[4] Small amount of venture capital provided to the entrepreneur for concept/new idea testing and to customize that idea is called seed capital.

[5] Financing an enterprise just before its initial public offerings (IPOs) is called venture capital financing at mezzanine stage.

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ON THE EFFICACY OF AS-20 : EARNINGS PER SHARE*

Sumana Sur (Ghosh) and Tanupa Chakraborty **

Abstract : AS-20, issued by the Institute of Chartered Accountants of India, became mandatory for listed public limited companies effective from 1.4.2001. Since EPS is single most measure widely used in financial analysis, this paper deals with the efficacy of the standard. Although the standard in question is not free from certain limitations, AS-20 and IAS-33, both on EPS, have greater compatibility than many other standards in other areas.

Key Words : EPS, Cash EPS, Diluted EPS, Quality of EPS.

1. Introduction

It is well known that accounting standards are meant for harmonizing the diverse accounting policies and practices adopted by companies and for ensuring consistency in the reported information of a company from year to year so that users of financial statements are in a position to comprehend them and use them for decision-making purposes. Since 1979, the Institute of Chartered Accountants of India (ICAI) have issued 23 accounting standards of which 22 standards (AS-1 to AS-22) have become mandatory[1] by 1.4.2001. AS-23 will become mandatory from 1.4.2002. AS-20 : Earnings Per Share is one *outof* the first category. The focus of this paper is on Earnings Per Share (EPS).

EPS is critical to financial analysis. It is single most widely used statistic in financial analysis today. It is used by the shareholders (present and potential) in evaluating the performance of the company for taking investment decisions[2]. In the U.S., the Financial Accounting Standard Board (FASB) issued SFAS - 128 on EPS (in replacement of APB opinion on the issue) — which became effective from accounting period ending after 15.12.1997. The International Accounting Standard Committee (IASC) issued IAS-33 on EPS in February, 1997. In the U.K., FRS-14 was

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[1] Sub-sections (3A) and (3B) to section 211 of the Companies Act, 1956 (amended in 1998) stipulate that "every profit and loss account and balance sheet of the company shall comply with the accounting standards". In case of any deviations, the reasons for such deviations and the financial effect thereof are also required to be given.

Sub-section 3(I)(d) of section 227 of the Act, dealing with powers and duties of auditors (introduced in 1999), requires an auditor to state "whether, in his opinion, the profit and loss account and balance sheet complied with the accounting standards referred to in sub-section (3C) of section 211."

[2] EPS may be used in absolute form for the decision or may be used as a component of other key ratio-s used for the purpose. Price-earnings ratio (market price per share ÷ EPS) is an example on the point. P/E ratio is widely used for investment decisions. It reflects investors' assessments of a company's future earnings and their willingness to pay for the shares of the company. This is because the shareholders feel that the future growth in earnings will provide an adequate return on the investment.

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issued on EPS in October, 1998 (effective from accounting period ending on or after 23.12.1998). Many other countries, namely, Australia, Canada, Mexico, New Zealand and some countries in the European Union followed suit. IAS-33 might have helped significantly in improving the reporting environment. The issuance of AS-20 is therefore a welcome step. It is in this context that the present paper examines the following issues :

- Is AS-20 in conformity with IAS-33?
- Has IAS-33 helped harmonization internationally in respect of EPS?
- How is a company required to disclose EPS in the annual statements? Is any part of existing financial statements required to be changed to make the EPS information user friendly? If so, what are the possibilities?
- Does AS-20 focus on the quality of EPS data?
- What are the corporate reporting practices in India, if any, in this context?

The remainder of the paper is organised as follows. Section 2 makes a comparison between IAS-33 (IASC) and AS-20 (India) to resolve the above mentioned first two issues. Disclosure of EPS in the financial statements and qualitative aspect of EPS are given in section 3 and 4 respectively. Section 5 shows the corporate practices in India. The last section gives concluding observations.

2. IAS-33 and AS-20 : a comparison

Founded in 1973, the International Accounting Standard Committee (IASC) has evolved, over the last several decades, as the signal force in international accounting standard setting. So far, it has issued 41 accounting standards in different areas. Current goals and objectives of IASC, most succinctly stated in its five-year plan (1991-95) are: (a) developing international accounting standards (IASs) that meet the needs of capital markets; (b) ensuring that the IASs meet the financial reporting needs of developing and newly industrialized countries; (c) developing other documents that meet other financial reporting needs that are important internationally; (d) working for greater compatibility between national accounting requirements and IASs and promotion of the use of the IASs. In short, IASs are used in different ways in different countries - the standards are adopted as national standards, (e.g. Kuwait, Malta, Oman, Pakistan etc.), national standards may be developed independently having broad agreement with IASs (India and many other countries fall in this group), national standards may be developed independently explaining where and how these standards differ from corresponding IASs (e.g. Australia, New Zealand, the U.K. etc.) or national standards are developed independently without any reference to corresponding IASs (e.g. Germany, Japan, the USA, etc.) (Basu, 2000).

In view of the above, we compare, IAS-33 and AS-20 to examine whether ICAI and IASC are "working for greater compatibility between national accounting requirements and IASs and promotion of the use of the IASs".

Table 1

Earnings per share : IAS-33 & AS-20 - a comparison

Particulars	IAS 33	AS 20
1. What should be shown	Basic EPS & Diluted EPS for each class of Equity Shares	Basic EPS & Diluted EPS for each class of Equity Shares
2. Where it should be shown	On the face of the income statement	On the face of the statement of profit or loss
3. Quality of Earnings	All items of income and expense including tax expenses & extra-ordinary items recognised in a period should be adjusted to arrive at net profit or loss (para. 3).	All items of income and expense which are recognised in a period, including tax expense and extraordinary items, are included in the determination of the net profit or loss for the period unless an accounting standard requires or permits otherwise (see AS-5) Net profit or loss for the period, prior period items and changes in accounting policies). (Para.12)
4. Computation of denominator	Weighted average no. of ordinary shares outstanding during the period	Weighted average no. of equity shares outstanding during the period (Para. 15)
5. Adjustment for computing Diluted EPS	i) Profit attributable to shareholders by the amount of, say, interest on convertible debentures and the tax savings ii) Weighted average no. of shares to be adjusted by say, addition to shares resulting from conversion	Same as column 2
6. Date of implementation	1.1.1998	1.4.2001
7. For whom applicable	Listed companies	Listed companies. Unlisted companies showing EPS must also follow the same principles
8. Clarity	Concise	More comprehensive, elaborative and illustrative

Source : IAS-33 & AS-20.

. A comparison between IAS-33 and AS-20 having regard to a number of attributes shows that there is no fundamental difference among them and that AS-20 is in line with IAS-33. There are some differences between SFAS-128 and IAS-33 with respect to disclosure of EPS (Agarwal, 2000). But as far as, computation of EPS is concerned, there is no material difference. But in respect of many other standards, there are fundamental differences between FASB standards and IASC standards. Two examples on the point are : (I) SFAS-95 and IAS-7 on Cash Flow (Dhar, 1998), and (ii) SFAS-13 and IAS-14 on Segment Reporting (Sen, 2001). So, IAS-33 has been able to harmonize accounting standards in many other countries. Given the difficult task of harmonization (Basu, 1994) this is no doubt a significant achievement of the IASC and, surely, AS-20 of India is a result of the sustained efforts of IASC for harmonization.

3. Disclosure of EPS in the financial statements

Both IAS-33 and AS-20 state that EPS and Diluted EPS should be disclosed prominently on the face of Income statement (profit and loss account). AS-20 states that "the focus of this Statement is on the denominator of earnings per share calculation. Even though earnings per share data has limitations because of different accounting policies used for determining 'earnings', a consistently determined denominator enhances the quality of financial reporting". (Objective clause).

So we have to address the issue whether "quality of financial reporting" would enhance because of disclosure of EPS and Diluted EPS.

Research studies (Dasgupta, 1977; Chakravorty, 1994; Banerjee, 1999) have shown that there is lack of uniformity in the disclosure of information in the Income statement (profit and loss account). The ICAI in its earlier study, Trends in *Published Accounts* (1985), stated as follows :

"The contents of the profit and loss account and the order in which these were given differed widely from company to company, probably because the law merely prescribes the information to be given in the profit & loss account without prescribing a form for the purpose" (p-73). The Indian position has not materially changed since then.

The British Companies Act, 1989, suggested two formats (horizontal and vertical) of profit & loss account. Profit and loss account can be prepared under each of these formats classifying the items of expenses either under functions (production, administration, distribution etc.) or under nature (e.g. staffing costs, depreciation, interest etc.). We refer to the British Companies Act because, historically, India has inherited a lot from the British system. The U.S. has developed a very good financial reporting system for the listed companies. A reference to the U.S. may not therefore be out of contest. The format for the income statement followed in the U.S. is more informative for understanding and decision-making. The first portion of the statement shows operating profit or loss [i.e. sales less cost of sales = Gross margin; Gross margin less selling, general and admn. expenses and operating expenses (including depreciation) to show operating profit or loss before interest, taxes, gains & losses]. The next portion gives information on peripheral or incidental activities, extraordinary items etc. Distinguishing between the financial effects of a company's major or central operations and those of other activities or events help users to analyse trends affecting the business without the potential distortive effects of peripheral or incidental activities. The last section shows effects of extra-ordinary items and changes in accounting policies to show, finally, the amount of net profit or loss for a period. Thus, distinguishing between the financial effects of a company's usual and recurring activities and those of other activities improves the analysis of understanding trends and relationships in a company's ongoing businesses.

The reason for presenting the income statement in three important sections is to enable reporting EPS section-wise rather than as a whole as shown below with hypothetical figures.

	Rs.	EPS Rs.
Weighted average no. of ordinary shares outstanding during the year : 1,00,000		
Income from continued operation	5,60,000	5.60
Less : Loss from discontinued operations	2,10,000	(–) 2.10
Income before extraordinary item and effect of change in accounting policy	3,50,000	3.50
(–) Extraordinary loss from fire net of income-tax savings (Loss 1,00,000 and tax rate 30%)	70,000	0.70
(–) Effect of change in accounting policy	20,000	0.20
	90,000	0.90
Net Income	Rs. 2,60,000	2.60

The above disclosures would enable decision makers to recognize the effects on EPS of income from continuing operations, as distinguished from income or loss from material items not typical of regular operations. EPS from continuing operations is generally the most useful per share amount as it provides the best basis for predicting future operating results.

4. Quality of EPS

The quality of EPS is the most important question because reliability and decision-usefulness of EPS depends on its quality. If the measure is true, fair and sustainable, then it serves the purpose whether it is used as a single measure or used as a component of a ratio (e.g. P/E ratio).

The quality of net profits after tax depends on the quality of matching of expenses with revenues for a period. Profits are influenced by accounting policies concerning valuation of inventories, basis of charging depreciation, treatment of pre-project expenditure, amortization of goodwill and deferred revenue expenses, capitalization of interest on borrowings, accounting for grants and other liabilities, to give a few examples. So, quality of EPS depends how objectively profits have been arrived at. AS-20 remains silent on the qualitative aspect of EPS.

It may be argued that there are checks and balances in the accounting process that ensure quality of accounting information. Although there is considerable force in this argument, in reality the reliability of accounting information is put to question. What is then necessary is to strengthen the enforcement machinery for ensuring compliance with accounting principles and standards. Excepting a very few countries (e.g. U.S.A.), the enforcement of standards is not at all satisfactory (Choi, 1998). The problem of enforcement of IASs is of greater dimension in the absence of any internationally acceptable enforcement agency.

We therefore suggest that the concern of the ICAI to uphold the quality of EPS should be expressly recorded in the standard. Second, the idea of having an independent agency to monitor compliance of accounting standards may be given a trial (Banerjee, 2001). This will have a further check on the system to monitor non-compliance by the statutory auditor. The quality of accounting information will then improve with consequential qualitative change in EPS.

5. Present Indian Practices

It is true that AS-20 has been mandatory for listed companies w.e.f. 01.04.2001. So, reporting practices in compliance with AS-20 can be ascertained by examining annual accounts of these companies for the financial year 2001-2002. Further, companies whose shares are not listed on the stock exchanges may also publish information on EPS but in such cases the same principles as mentioned in AS-20 have to be followed.

The international scenario is nevertheless different. IAS-33 on EPS became effective from 1.1.98. In the U.S.A. publication of elaborate information on EPS became mandatory even earlier i.e. from 1.1.1997. So, it can be presumed that this international reporting scenario might have made a favourable impact on the reporting practices of leading Indian companies. To what extent this is a reality may therefore be tested from scanning the annual reports of selected public limited companies for the financial year 2000-2001.

Our sample comprises 30 companies which are divided into 2 groups. Companies enlisted on BSE and Nifty Sensex (21 representing 70% of the sample) whereas the second group comprises 9 companies which are not listed on either of the two stock-exchanges. 10 out of the 30 companies do not disclose EPS information in their Annual Accounts. The position is shown in table-2.

Table 2

Companies not reporting EPS

Sl. No.	Name of the company	Listing on stock exchange	No. of Companies in the group	%
1.	Prudential ICICI Technology Fund	Others	9	55.6
2.	Nucent Finance Ltd.			
3.	SAIL			
4.	UTI			
5.	IDBI			
6.	Reliance Petroleum Ltd.			
7.	Gujarat Ambuja Cement Ltd.	BSE Sensex & NIFTY	21	23.8
8.	Nestle India Ltd.			
9.	ACC			
10.	Grasim Industries Ltd.			

Source : Annual Reports of Companies (2000-2001).

Out of 10 companies that have not disclosed, 5 are listed on BSE Sensex or Nifty and the remaining 5 belong to the 'Other' category.

The remaining 20 companies are however disclosing EPS in some form or the other (table 3).

Table 3

Companies disclosing EPS figures in Annual Reports (2000-2001)

Name	Overall picture	EPS*	Cash EPS & EPS**	Diluted EPS#	Basic & Diluted EPS@
	No. %	No. %	No. %	No. %	No. %
1. ITC Ltd.	✓				✓
2. ICICI	✓			✓	
3. Tata Steel	✓	✓			
4. Hindalco	✓		✓		
5. BSES Ltd.	✓		✓		
6. Reliance Industries Ltd.	✓		✓		
7. Infosys Technologies Ltd.	✓				✓
8. Colgate Palmolive	✓			✓	

9. Indian Oil Corporation Ltd.	✓				✓					
10. Tata Chemicals	✓		✓							
11. Manindra & Mahindra Ltd.	✓		✓							
12. State Bank of India	✓		✓							
13. BHEL	✓		✓							
14. HLL	✓		✓							
15. HDFC Bank	✓		✓							
16. Reckilt & Bencham	✓		✓							
17. ICI	✓		✓							
18. Mirc Electronics Ltd.	✓				✓					
19. Videocon International	✓		✓							
20. Bata	✓		✓							
Total	20	100	11	55	5	25	2	10	2	10

Source : Annual Reports of companies (2000-2001)

Notes :

* $$\text{EPS} = \frac{\text{Earnings attributable to equity shareholders}}{\text{Number of equity shares outstanding as at the end of the period}}$$

Further, earnings attributable to equity shareholders is profit after tax reduced by preference dividend.

** $$\text{Cash EPS} = \frac{\text{Cash Earnings attributable to equity shareholders}}{\text{Number of outstanding equity shares}}$$

Here, cash earnings mean earnings adjusted for non-cash items of expenses like depreciation, amortization, etc.

# $$\text{Basic EPS} = \frac{\text{Earnings attributable to equity shareholders}}{\text{Weighted Average number of outstanding equity shares}}$$

@ Diluted EPS is the ratio of diluted earnings to weighted average number of shares outstanding adjusted for potential dilutive securities. Dilutive securities are those which have the potential of diluting i.e., reducing the EPS figure. Some examples of such securities are convertible debt, convertible preference shares, share warrants and the like. Hence, the dilutive effect of such securities on earnings and number of shares outstanding is incorporated while determining diluted EPS.

Findings

It may be stated that out of the 20 companies that have disclosed EPS, 16 of them are listed on BSE Sensex and Nifty. The rest 4 belong to the 'Other' category group.

Table 3 shows that the majority of the companies have reported only EPS in their annual reports. Out of the 20 companies, 11 (55%) have reported only EPS, 5 (25%) have reported both Cash EPS and EPS, 2(10%) have reported diluted EPS, balance 2(10%) have reported both diluted and basic EPS.

The companies that reported 'EPS and cash EPS' or only 'EPS' have not defined the computation methods. The notable exception being Indian Oil Corporation Ltd. which reported that its EPS and cash EPS figures have been obtained after considering issue of bonus shares. ICICI and Colgate Palmolive disclosed that its EPS figures have been derived after adjusting for convertible debentures converted into equity shares and bonus/rights issue respectively. Of the two companies that reported 'basic' and 'diluted' EPS, the definition given by ITC Ltd. conforms to the one discussed in note above. In contrast, though Infosys Technologies Ltd. has not defined 'basic' and 'diluted' EPS, it has reported that such figures have been derived from ordinary activities. This is in keeping with the format suggested by the British Companies Act, 1989 for the preparation of the Profit and Loss A/c. Also, as highlighted in Section 3, companies may be advised to follow the format shown by Infosys Techologies Ltd. in disclosing EPS figures because EPS from continuing (main-line) operations is the best possible indicator of future operating results.

Interestingly, the EPS figures of all the companies surveyed are found to be contained in 'Financial Highlights' segment and not in 'Profit and Loss Statement' as prescribed by AS-20. The mode of computation of EPS and the factors influencing the computation are not also disclosed. Since the picture presented above pertains to the period before AS-20 became mandatory (as the annual reports that have been examined relate to the period 2000-2001), it is hoped that the compliance with the standard will definitely improve the quality, type and manner of reporting EPS amongst companies.

6. Concluding observations

The issuance of AS-20 is a welcome step. AS-20 provides a good example where ICAI and IASC are "working for greater compatibility between national accounting requirements and IASs and promotion of the use of the IASs." It is good sign for international accounting harmonization particularly when many leading Indian companies are accessing to foreign capital markets. For increasing the effectiveness of the disclosure of EPS information for decision making purposes, EPS from continuing operations is to be computed and disclosed separately. Difficulties in computing Diluted EPS are likely to persist for some time till good practices are developed by the profession. In theory, Diluted EPS serves as a warning to equity shareholders that the return on their investment may fall in future periods. Diluted EPS is only a past performance measure and is not intended to be forward-looking. Finally, while using EPS data for decision making purposes, one should keep in mind some of its inherent limitations :

- EPS is a measure of profitability. Profitability is only one aspect of performance and does not capture many other important aspects (Kaplan and Norton, 1995).
- Net profits attributable to the shareholders are affected by the choice of accounting policies of a firm. Hence, unless there is strict compliance of

accounting policies consistently, comparison of EPS will not serve any meaningful purpose.

- When inflation rate is high, apparent growth in earnings may not be true growth.
- EPS may not always provide predictive value. As for example, high earnings and growth of earnings may be achieved by undertaking new projects which may generate increased earnings.

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SOFT SYSTEMS METHODOLOGY AS A TOOL FOR BUSINESS ETHICS RESEARCH

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Abstract : The present paper establishes that business ethics is a discipline in its own right. It demonstrates the fuzzy and eclectic nature of this emerging discipline, which has descriptive (or fact) as well as normative (or value) components. Considering the vast array of "right-versus-right" ethical decision situations in the real world of human problems, it is posited that systems thinking, particularly the "soft" interpretative approach, is a far more appropriate mode of enquiry into ethical questions than the deep-rooted and almost sacrosanct scientific method of empiricism. The most popular form of soft systems thinking that has evolved over the last thirty years is referred to as Soft Systems Methodology [SSM], developed by Checkland and his associates at the University of Lancaster. The paper examines the appropriatenes of SSM for business ethics research by underscoring the context and distinctive characteristics of SSM, and how it is fundamentally different from the "hard" systems tradition. The learning/inquiring nature of the SSM process is articulated in terms of the original seven-step model, as well as the revised four activity model. To aid a clear understanding of the SSM process in action, the rich epistemology of the methodology is also analysed. A few instances of SSM experience in business and elsewhere are cited together with the outcomes of its application. Finally, the pre-conditions for SSM effectiveness are identified in order to arrive at a judgement of the potential of SSM as a research tool for developing and enriching the fledgling intellectual field of business ethics.

Key Words : Business ethics; Right-versus-right choices; Hard and soft systems approaches; Soft Systems Methodology; *Holon;* Human activity system; Rich pictures; Root definitions; *Weltanschauung;* Ontology; Epistemology; CATWOE; 5-Es.

The Fuzzy Field of Business Ethics

Ever since management has emerged as a professional activity in corporations, and business enterprises have grown in size and power to pervasively impact myriad aspects of modern society, attempts have been directed towards developing a moral philosophy for management and a set of ethical guideposts for managerial decision-making. These efforts reflect a constant concern about the ethical issues that impinge on business practices as part of human endeavour. This concern has, however, accelerated lately both in the corporate world as well as in schools of business and management, making one thing crystal clear : *While the subject matter of business ethics is by no means a present-day concern, the development of business ethics as an intellectual field, is.* Over the last two decades, a growing volume of literature has developed, and journals in business ethics have been published to promote discourse, writing and research in the area. This has prompted business ethics to come out of the yoke of its erstwhile status of a peripheral "add-on" subject supplementing existing courses, and to hold its ground as an independent discipline.

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The popular stance within the portals of the business world that there is no such thing as business ethics : business and ethics just do not mesh. To business executives, "business ethics" is an oxymoron, which implies either that business is *immoral* by its very nature and should be accepted as such, or that business is *amoral* and moral considerations are inappropriate here. However, media exposure about business scandals and unethical practices make it readily apparent that business organisations are by bo means amoral; indeed, they do have far-reaching ethical impacts and they ought to be treated as moral entities.

As a discipline, business ethics is a sub-set of the study of ethics, in general, which is concerned with actions and practices directed towards improving the welfare of society, in its broadest sense. It involves a philosophical inquiry into various theories of what is good and what is bad, what constitutes right or wrong behaviour, and what one ought to do or not to do, in order to promote social welfare and to attain a life worth living (Buchholz et al., 1998, p.2). By this token, business ethics raises questions about corporate social responsiveness, social responsibility and public policy. These are fundamental to business because it is a social institution. Society allows institutions to be developed and to continue to operate based on society's conceptions of human welfare and what makes a life worth living. Thus, business needs to change as society's notions of these ethical concepts change. In responding to social and political issues, moral and ethical dimensions of business must be explicitly recognised and debated in order to develop a vision of the future role of business and the appropriate roles it should play in society. As such, social institutions serve a fourfold purpose : they create opportunities for pursuing self-interest; they create opportunities for developing family relationships and friendships; they create opportunities for establishing formal groups and promoting their interests; and they create opportunities for pursuing fairness, justice and human rights. These four institutional purposes are represented by four categories of overlapping values and ethical rules (Kohlberg, 1981) : self-interest, personal relationships, group well being, and universal ethical principles. This explains why we need to understand the ambiguity of values and ethical rules (Dienhart, 2000, p. 95) in order to understand the complexities of the purpose and institutional settings of business.

Ethical questions in business arise in three different guises : problems, dilemmas and false dilemmas. We have an ethical problem when we do not want to do what we believe is right. We have an ethical dilemma when every course of action violates some important ethical concern, while simultaneously satisfying some other. A false dilemma is one that *prima facie* appears to be a dilemma, but disappears on further analysis, acquisition of new facts, or resolution of value conflicts. Irrespective of their nature, ethical questions are difficult to address; they have to do with a definition of human welfare, the meaning and purpose of life, the nature of the human community, the relationship between the human community and Nature, and similar questions that are very basic to human existence. These questions cannot be answered by resorting to the quantification afforded by an economic calculus such as profit / loss; nor can they be satisfactorily answered through a political process based on power and influence. Another difficulty with these questions is that they are often matters of right versus right, not right versus wrong (Badaracco, Jr., 1997, pp. 1-5). Right-versus-right decisions involve hard choices between alternative ways of resolving a situation, each of which seems the right thing to do, but there is no way to do both. They are troubling, complicated, serious and far too important to ignore. They often become questions about life and not merely management because of their finality. They can have powerful and irrevocable consequences for the lives of decision-makers and for their organisations as well. Right-versus right choices defy standard solutions. They cannot be forced comfortably into familiar categories such as legal issues or economic issues or political issues or environmental issues, so that once we put the problem in the right compartment, we readily have the right concepts and tools for solving it. They are not purely intellectual issues, as they are fraught with the personal risk of a moral calamity of letting others down and failing to live up to their standards. Right-versus-right ethical decisions may therefore be rightly described by Sartre's metaphor of a "dirty hands problem" (Sartre, 1989, p. 218). Badaracco, Jr. (1997, p. 6) refers to them as "defining moments" because they have three basic characteristics : they *reveal* a decision-maker's and the organisation's basic values; they *test* the strength of the commitments that a person or an organisation has made; and above all, they *shape* the character of the person and organisation.

Owing to the complexity associated with choices between right-versus-right, business ethics is characterised as a fuzzy field of inquiry having five important characteristics (Hosmer, 1996). It involves an ethical analysis of decisions that have *extended consequences* beyond the first level, extending throughout society. These decisions mostly have *multiple alternatives* that go beyond a primarily dichotomous choice between yes and no. Also, they have *mixed outcomes* with directly opposed financial returns and social costs. Most of such decisions have *uncertain consequences* that are not deterministic at the time of making an ethical choice. Above all, they have *personal implications*, being inextricably entwined with the lives and careers of the decision-makers, and so, entail individual benefits/costs in addition to financial and social benefits and costs. The use of the term "fuzzy" indicates that in order to grapple with the hard choices that ethical questions raise, humans obtain knowledge about themselves, their expectations and behaviour, and their environment by way of perceptions, which is the link between the outer world commonly called "material" and the inner world often broadly referred to as "mind". We see, hear, taste, smell and feel form, size and texture. Finally, all these sensory perceptions merge into a complex background and can no longer be isolated, resulting in an inherent vagueness in the words of natural language we use to convey our mental images. An essential characteristic of a vague concept is that the boundaries of the domain of its applicability are not fixed, and therefore, we do not know precisely where this domain ends and some other begins. This vagueness is not thought of as inherent in the real world but in our use of words and the meanings we attribute to them (Negoita, 1981, p. 7).

The concept of a discipline or an intellectual field (Checkland and Holwell, 1998, pp. 31-34) implies a shared concern to accumulate knowledge in a particular area to resolve issues within it, to solve problems or puzzles, and to influence any action taken. There is also the implicit notion that the body of knowledge will grow, and that the field will spawn insitutional activity in the form of courses, conferences, journals, and possibly professional bodies. As problems are handled and investigations are made, the field will create and/or import tools, techniques and approaches that will themselves develop in use. As research proceeds and findings accumulate, debate among members of the relevant community will lead to the enrichment of the body of knowledge, and to the definition of new issues and problems. The process has two aspects—*cognitive* and *social*. The cognitive aspect is concerned with the development of that which counts as knowledge in the field : findings, issues, topics and tools. The investigations and debates, which create this knowledge, constitute a social process that takes place within a particular community of interested people. They will have to share language and perceptions to a significant degree if investigation and debate are to be possible.

In a mature intellectual field, for example physics or chemistry, the general structure and content of the field and its processes are transparent. They are taken as given by workers in the field, who simply assume the existence of structures and processes, and get on with the substantive work. But, in the case of a discipline in its natal stage, such as business ethics, transparency of this kind is hard to come by. A field that is relatively recent in development and piecing itself together, is still quite far away from having a taken-as-given structure and content, within which the energy and attention of reserchers can be concentrated on substantive work. Practically, everything about it—its focus, methods, norms, language and standards—is problematical.

What is more, the method of conducting research in natural sciences is based on the three principles (the 3-Rs) of reductionism, repeatability and refutation of hypotheses, which has been immensely successful and has become the dominant model of almost all research activity. There is a complete separation of fact and value. Descriptive statements deal with matters of "fact" and attempt to clarify to people the way things are or the nature of reality. Such statements are the purview of natural science that attempts to objectively analyse real-world problems and establish relationships between variables to undersatnd the way the world works. On the other hand, prescriptive statements deal with questions of "value" and attempt to prescribe the way things should be in order to obtain the good life, or be consistent with the notions of human welfare and enrichment of human experience. They are believed to be inherently subjective, representing opinions about what ought to be done. Thus, when individuals differ on what is right or wrong, this difference is one of opinion or feeling. In this sense, moral statements, the substance of business ethics, are viewed as statements of opinion or feeling, having no objective basis where their truth-value can be determined. People can never really "disagree" about the morality of an action, nor can they be "mistaken" in their moral judgements, since statements of opinion or feeling are relative and cannot be invalidated or shown to be false. The fact-value distinction leads to the view that facts do not guide action in terms of what ought to be done. They are descriptions and causal explanations of natural and human phenomena. By contrast, value judgements have an action-guiding function. They commend or condemn particular courses of action even if the commendation or condemnation is held to merely express subjective feeling or state an absolute standard.

Today, in a world that is empirically oriented, research is often construed as "thinking scientifically" with the testing of hypotheses by collecting the brute facts that provide value-free descriptions and causal explanations of natural and human phenomena. It must be appreciated that the hypotheses tested by natural scientists are concemed with the natural regularities of the universe, and all the evidence points to their regularity. Irrespective of the difference in hypotheses that researchers offer, the actual structure and/or processes in nature remain entrirely unaffected by our having theories of them. However, the methods of natural science that are so productive in enabling external observers to discover the regularities of the natural universe, are extremely difficult to apply to human problem situations. These situations constitute a social reality that embraces social acts requiring the concerted action of many different kinds of people. The human phenomenon involved can attribute meanings and make judgements that differ from person to person. Here, a disintersted observer cannot correctly collect brute, value-free facts of a so-called organic system (such as persons, groups or societies) having emergent qualities as if it were a deterministic-mechanistic system obeying universal laws. Value is an emergent quality in the interactive context of organisms within nature, and is as real as all other qualities within nature. Moreover, any experienced fact within the world can have a value dimension, which emerges as an aspect of the context wherein the fact functions as value relevant (Buchholz et al., 1998, P. 89). It is what we hold as valuable that enters into our perception of the facts. Facts do not come to us ready-made by announcing their "brute given-ness". Ultimately, human beings have to decide what they accept as a fact and what they believe to be the nature of reality. They have to decide the adequacy of evidence and the appropriateness of methodologies for answering questions about a particular part of reality. They have to interpret the facts and describe what these facts mean. All these acts will be influenced by what they hold as valuable.

Thus, social reality must be seen as being continually constructed and reconstructed in dialogue and discourse among human beings, and also in action that they take. Accordingly, researching social reality is interpretative. It is an organised discovery of how human agents make sense of their perceived worlds, and how these perceptions change over time, and differ form one person or group to another (Checkland and Holwell, 1998, p. 22). Most of the facts about our uncertain, probabilistic world with its myriad, organically integrated systems of interrelations are disputable and changing e.g., the efforts of medical science to establish the truth of claims about human health in relation to smoking, workplace hazards, or the toxicity of substances constituting manufactured products. Science or any other method cannot conclusively prove complex issues of this nature. Thus, an ethical reasoning process that states that making an ethical decision simply involves gathering of value-free facts about the situation fails to recognise its complexity. Consequently, business ethics cannot be taken as a "science" in which an observer collects the facts and determines the mechanistic laws goveming them to the neglect of the "fuzzy" unscientific realm of values.

At a very fundamental level, any research activity in any mode entails three vital elements. A particular framework of ideas (F) are used in a methodology (M) to investigate some area of interest (A). Undertaking the research might cause a vigilant researcher to learn things about all three elements, particularly if with the evolution of the research programme, F, M and A all change. The change to, or extension of F, M and A, is typical of action research, and must be expected when research is conducted in that mode. Initially, the researcher deals not in hypotheses but in research themes within which lessons can be sought. The researcher starts by finding a realworld situation (A) that seems relevant to research themes he regards as significant. Then, he negotiates the respective role(s) of researcher and people in the problem situation to reduce the ambiguity that exists in the complex dual role of the researcher as a *participant* involved in the action, and as an *external observer* consciously reflecting upon it to extract useful lessons. Next, it is essential to declare the framework of ideas (F) and the methodology (M) in which they are embodied. The substantive work can begin with the researcher becoming involved in the action of the situation (usually not with the same degree of involvement as those who would be tackling the problem even if no researcher were present). The aim is to help bring about changes felt to be improvements. In doing this, the researcher tries to make sense of the accumulating experience, which might cause a re-thinking of earlier stages.

The present paper explores the suitability of Soft Systems Methodology [SSM] as a way of implementing the process of action research in business ethics. Since business ethics is an integral part of the domain of human affairs, action research is indeed a relevant way of investigating many of the issues surrounding it. Business ethics is, *per se*, both a normative enquiry as well as a descriptive science. Hence, it has a dual objective--it evaluates human practices in the realm of business by referring to moral standards, and it may give prescriptive advice on how to act morally in a specific kind of situation. Ethical questions must, therefore, be dealt with explicitly by debating them on philosophical as well as on empirical grounds (Buchholz et al., 1998, p. 93). This makes the contention of the paper all the more germane. Furthermore, the following four attributes (Pratley, 1997, pp 7-8) of research in business ethics largely substantiates the relevance of the application of SSM to this discipline :

1 It studies existing corporate policies that have an *impact on human and ecological well being*. These actual policies and behaviours constitute business morality, which is expressed as a given set of convictions and activities, both inside and outside a company, in relation to business issues.

2 It involves a *comprehensive study* of corporate policies and not the study of an isolated act. Moreover, business activities have to be seen in a context of external and internal forces.

3 It demonstrates that seemingly scandalous behaviour at first sight may *subsequently figure as minor excesses* amongst a multitude of numerous careless, unjustified and even criminal deals.

4 A careful and *broad-based study of phenomena* is necessary to place things in proper proportion, because a balanced understanding of the factual context is a desideratum of any ethical evaluation.

Developments in Business Ethics Research : Issues and Methodologies

Being an electic discipline in its infancy, business ethics accords a significant role to academic research to promote its rapid development through systematic inquiry that is for the most part interdisciplinary. The nature, heritage and the primal stage of development of this field of study, prompt aspirant researchers to experiment with a melting-pot of ideas drawn from diverse fields of study—philosophy, economics, business, political science and other social sciences, mathematics, physical sciences, engineering, history, literature, and the liberal arts. An understanding of the world arrived at by such a verdant confluence of ideas helps understanding, learning and/or solving multi-faceted real-world dilemmas that emerge in the open book of the classroom of life.

Research in business ethics is wide-ranging both in terms of the issues dealt with as well as the methodologies that can be applied thereto. Fleming (1990, p. 6) corroborates this by providing a typology of research topics in this field as gleaned from a survey that he conducted on Business Ethics research in 1986. The survey revealed that eight distinct areas had come up for scrutiny by researchers, with varying degrees of popularity. These areas are :

1. **Capitalism and the Economy** : Ethics of business; Ethics and profits; Government law and business; Self-regulation; Technology and business.
2. **Industries** : Automobiles; Biotechnology; Chemicals; Consulting; Defence; Financial services; Information and telecommunications.
3. **Corporations** : Corporate culture, belief and values; Codes of ethics; Corporate governance and stakeholders.
4. **Multinational Corporation [MNCs]** : MNCs in Third World countries; MNCs self-regulation; Cross-cultural study of ethics.
5. **Functional areas** : Accounting; Human resources; Management information systems; Manufacturing; Marketing; Product development; Public affairs.
6. **Managers** : Decision-making; Ethics of management; Managerial values and value systems; Moral reasoning development.
7. **Employees** : Duties; Rights; Unions.
8. **Metaethics** : Theory of ethics; Relationship of religion to business ethics; Ethics and economics; Applied ethics.

The methodologies applicable in business ethics research may be divided after Goodpaster (1948) into three parts. The classification is based on the approaches usually adopted for the study of ethics—*normative ethics, descriptive ethics* and *metaethics*. This is shown below in Exhibit 1.

Each method in these three basic types may be seen as lying on a continuum with the ends as opposing extremes. Normative ethics is concerned with the formulation of basic moral norms governing moral life, and with the presentation of a particular set of principles and standards that would be best for people to follow in all dimensions of their lives. Thus, research on normative ethics is not morally neutral, and includes studies that deal with the concepts of right and wrong, good and bad.

At one end of the continuum are the principles from philosophy and theology, and at the other end is business practice as found by investigation. Descriptive ethics denotes a neutral approach, because it does not advocate one set of values and beliefs over another. It consists of scientific studies or factual descriptions and explanations of moral behaviour and beliefs in various societies or institutions. It primarily describes and explains phenomena and behaviour in the real world without passing value judgements as to whether they are right or wrong, superior or inferior. The end-points of the continuum for research on descriptive ethics are empirical and conceptual. The former has to do with observing and collecting data from the environment. Conceptual inquiry deals with the development of ideas and relationships in the mind and their presentation in a way that reduces the complexity and increases the understanding of the real world. Metathics consists of an analysis of the central terms in ethics in order to understand the foundations of ethical systems and the functions of ethics in a social system. It is concerned with the development of ethical theories and the relationships of different theoretical systems and disciplines.

Exhibit 1 : Methodologies Applicable to Business Ethics Research

Normative		Descriptive	
Principles	Practice	Empirical	Conceptual
Critical Thinking (Case Example)		• Questionnaire • Interview • Cases • Historical analysis • Quantitative analysis	• Essay • Outline • Model

Metaethics	
Theoretical systems	Individual theories
• Theoretical analysis • Theoretical synthesis • Relationship to other systems	

Business ethics research is largely associated with attempts to understand and explain human behaviour and action by applying moral standards to the conduct of individuals involved in activities within business enterprises that produce and distribute goods and services for the well being of modern society. The following are a few samplers (Frederick and Preston, 1990, p.xi-xii) exemplifying the fascinating range of ethical questions that can come up for analysis and inquiry :

- Does managerial ideology foreordain the ethical outcomes of managerial decisions?
- Why do organisations and their managers sometimes break the law ?
- Do the personal values of managers influence the policies and practices of their companies?
- Do men and women managers handle work-related moral conflicts differently?

- Do written codes of ethics deter corporate crime?
- Is greenmail unethical?
- Can social justice and efficient hiring practices be simultaneously achieved through employee testing?
- Is animal testing of products an ethical R & D act?

In the field of business ethics research, an analysis of moral principles and norms is applied to the behaviour of people in business institutions. Accordingly, business ethics qualifies as a type of applied ethics that is concerned with clarifying the obligations and moral responsibilities of managers and other employees engaged in making business decisions that impact them, their co-workers and innumerable primary and secondary stakeholders. It is very much a normative endeavour of the researcher who is concerned with how managers and other employees ought to act in certain situations that arise in business contexts (Buchholz et al., 1998, p.3).

A significant characteristic that is observable in many business ethics research methodologies is that they are often used in combination. For instance, cases are used in conjunction with critical thinking and with empirical research using values-based questionnaires. Again, historical analysis may very well be a part of the case collection methodology. As a necessary corollary, an important second characteristic is the use of models from other cognate disciplines suitably adapted to this discipline. This clears the ground for a third characteristic of business ethics research, which is the increasing use of an interdisciplinary approach manifested in joint research endeavours by academics from seemingly unrelated disciplines. Some instances of interdisciplinary dyads in research (Fleming, 1990, p. 17) are philosophy-management, philosophy-law, management-theology, and religion-accounting.

Systems Thinking for Greater Clarity of Ethical Questions : Hard vs. Soft Systems

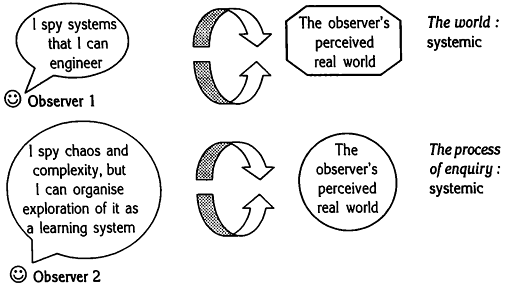
A distinctive trait of human beings is the quest for perfection. As *Homo sapiens,* we are a race of meaning endowing animals, at once autonomous and gregarious. We are able to look at the world, in which we live and visualise a different world where things are organised differently and better. We can then strive to change the world in order to usher in the desired improvements. Irrespective of the scale of the desired changes—individual, local or global—a process of inquiry must exist. Within this process is included a set of internally consistent mental constructs leading the observer to perceive the world in a particular way and to discern a problem or opportunity, and also providing guidance towards some end. The best known method of inquiry is probably the scientific method that began to be codified in 16th century Europe, and symbolises the *arc de triomphé* of the Western (scientific) civilisation. Its methodology of formulating hypotheses and testing them via controlled and repeatable experiments has become the epitome of rational investigation, and it has come to represent the plethora of scientific and technological advances that shape our everyday life. Popper (1959; 1972) and Kuhn (1962) have substantially contributed in the modification of our understanding of the scientific process. Today, we understand the end result of the process not as the discovery of absolute truths about the world but convincing and tested explanations of it.

Undoubtedly, the scientific method of inquiry is extremely effective as a means of understanding the physical world through well-controlled conditions within a laboratory setting. Nonetheless, the last one hundred years have revealed its unsuitability as a method of inquiry for every branch of knowledge especially because of the complexity, unpredictable impacts, and social nature of many problem situations. Any problem, for example, destruction of forests by acid rain, is a complex web of interrelated problems, which Ackoff (1974) describes as "messes". "Messiness" is typical of the problems that concern most of us in the modern world. The need to deal with such problems led to the emergence of an alternative method of enquiry referred to as systems thinking.

The problem identified and explored by the first generation of systems thinkers was that scientific method deals with complexity by reductionism, i.e., by breaking down a large, complex domain of investigation into smaller less complex sub-domains and an investigation of each of these, in turn. When this logic is applied to "real world" problem solving, it implies that a large and complex problem is nothing more than the sum of a number of smaller less complex problems and that solving all of those smaller component problems will equate to a solution for the larger problem. Furthermore, it is assumed that an identification of the individual elements of a situation, studying them in isolation, and searching for causes and effects will uncover both the nature of the problem and an identification of its solutions. A study of problem elements in isolation causes reductionism to overlook important interactions between the elements themselves and the possibility that complex entities might have *emergent properties* that do not belong to any of the constituent parts.

The possibility of *emergent properties* captured succinctly in Aristotle's dictum "the whole is more than the sum of the parts" prompts the need for developing new methods of inquiry to fully understand complex entities. Accordingly, the systems theorists proposed the concept of a system as the foundation for deriving sense about some part of the real world. They argued that the system concept could provide a holistic approach to analysis and inquiry that could be applied in diverse intellectual fields (Bertalanffy, 1950; Boulding, 1956) such as biology, physiology, zoology, anthropology mathematics and economics. What is more, it has come to establish an entirely new discipline that we know as ecology. However, the greatest potential of application of systems ideas with the most impact is the wide uncharted terrain of management and organisational behaviour.

Exhibit 2 : The Hard and Soft Stances of Systems Thinking


I spy systems that I can engineer
Observer 1
The observer's perceived real world
The world : systemic
I spy chaos and complexity, but I can organise exploration of it as a learning system
Observer 2
The observer's perceived real world
The process of enquiry : systemic

Attempts to relate systems thinking to systems practice have revealed a distinct 'hard'-'soft' dichotomy (Laszlo et al. 1997, p. 13), made explicit for the first time by Checkland (1983a, pp. 661-675). The hard and soft strands of systems thinking stem from the method of inquiry undertaken and how the word "system" is used, that is from the attribution of systemicity. Exhibit 2 succinctly presents the hard and soft stances of systems thinking.

In the literature, the hard or functional approach to systems thinking is appropriate in well-defined technical problems such as construction of buildings and engineering artefacts, whereas the soft or interpretative approach is more appropriate in fuzzy, ill-defined situations involving purposeful human beings and cultural considerations. Since the 1960s, hard systems thinking has been dominant as *the* systems approach, Since then, it has had a major influence on information systems thinking in terms of systems engineering, systems analysis and operational research [OR]. As a matter of fact, the use of the word system in common parlance as a label-word for a part of the world—educational system, transport system, healthcare system, legal system—unconsciously, yet steadily reinforces the assumptions of the hard systems paradigm. In systems engineering, RAND Corporation systems analysis, and classical OR the word system is used as a label for something taken to exist in the world outside ourselves. The taken-as-given assumption is that the world can be seen as a set of interacting systems, some of which do not work very well and can be engineered to work better. Below we present some of the important characteristics of hard systems thinking (Lewis, 1994, 28-33), together with a critique of its inappropriateness to socio-cultural milieus :

- **Single level of analysis :** When an analyst enquires critically of a situation with the intent of causing change, an intervention process is set in operation. Immediately, the nature of the situation changes and the behaviour of those in the situation may be altered, whether for good or for bad. The intervention may be construed in itself as evidence for a willingness to change leading to positive "Hawthorne" effects. Alternatively, it may be interpreted as interference leading to a lack of co-operation, or the arrival of the analyst may be viewed as threatening and arousing concerns regarding privacy and future job security. Thus, in any intervention process, the analyst is consciously or unconsciously working at two levels of analysis—the level of problem content, and the level of the intervention itself. The first level of inquiry is directed at that part of the world, which is seen as problematical and has caused the analyst to be there. The second level is concerned with the intervention itself, how to interact with those in the situation, how to organise the intervention, and the role of the analyst in the intervention. Hard systems methodologies—systems engineering, systems analysis and classical OR—address only the first level of analysis by prescribing the activities that should be done so that the analyst may solve the problem. They do not consider the intervention process to be problematical *per se*.

- **Problem-solving focus** : Hard systems thinking accepts as given that the role of the analyst will be to solve particular problems on behalf of an identified client, that problem-solving is concerned with the making of rational choices amongst alternatives, and that choices may be made by focusing upon 'objectives, alternatives and ranking' (Dewey, 1910). In social problem situations application of this approach to problem-solving presents a number of difficulties because they are characterised by a wide range of values and beliefs, which affect perceptions of the situation and what will constitute desirable change.
- **Adoption of power-holder views** : An obvious consequence of not questioning the nature of the intervention process is a tendency to support the status quo and the views of power-holders. Values play a key role in determining the choice of the problem to be solved, formulating the nature of the problem, and in the definition of evaluative criteria for choosing between alternative solutions. A hard systems study is rarely participative and stakeholder-inclusive, so that the views sought to resolve the problem and the sources of data gathered are almost always people with power in the situation—the managers, administrators, or those who are paying for the research project. Ready acceptance of power-holder views as the basis for analysis may not be practical in social situations where there are multiple interest groups with little congruence of values, but whose views must be accommodated, where there are ethical requirements for participation, and where power must be shared.
- **Emphasis upon objectivity** : The hard systems approaches underscore objectivity in analysis resulting in the tendency to ignore those aspects of a problem situation that cannot be easily quantified or modelled and to emphasise quantifiable data. The penchant for objectivity is what drives hard systems analysts to readily adopt the client's perspective upon the situation and their vision of what constitutes a problem.
- **Quantification and modelling** : Model building, involving the construction and manipulation of quantitative models as a substitute for experimentation with the real-life system, is at the heart of all hard systems approaches. The primary

reason is that analysis of a real-life system would usually be far too complicated, expensive and sometimes, may even be dangerous or hazardous to test all possible changes under all possible operating conditions likely to occur. Notwithstanding, in certain situations, especially where it is required to assign a value to life (human and / or non-human) and to decide whether all lives are equally valuable, it may be well nigh impossible to quantify all aspects of the situation when determining or predicting the impact of alternative solutions. Moreover, the quantification may be totally unacceptable to those involved in the situation so as to render the results of the study as meaningless.

- **Applicability within social situations** : The initial success of hard systems approaches as an aid to problem clarity and solution, in the 1960s, led to their application in many different fields and to many types of problems. Proponents claimed the ubiquity of these approaches, and saw no difference in designing a more effective automobile engine or telephone network from designing social systems where human beings exist as participants, and where ethical, social and political factors predominated. Experience suggests that this presumption is not workable because human behaviour cannot be understood and predicted in the same way as physical phenomena.

Based on the characteristics stated above, the major shortcomings (Dror, 1971) of hard systems thinking may be summarised as :

i. A neglect of the institutional contexts of the problems and policy making process.

ii. An inability to handle political needs.

iii. An inability to deal with irrational phenomena such as ideologies, charisma or self-sacrifice.

iv. An inability to deal with basic value issues.

v. An inability to invent new alternatives.

vi. An inability to deal with situations where predictability with regard to alternatives, is absent.

vii. A reliance on quantification leading to an inability to deal with complex social issues.

viii. An inability to improve the policy-making system.

On account of these deficiencies, by the 1970s hard systems thinking as an omnipotent method of inquiry seemed to lose its hold when the systems approach began to be applied to subtle and complex problems of organisations. Purposeful human beings were a major component of the problem; there was a lack of consensus in the values, beliefs and aspirations of those involved; goals were fuzzy and poorly articulated; and the problems were ill-structured, "wicked" and "messy" to render the extant systems approach ineffectual. Since the 1970s new strands of systems thinking have emerged to cope better with these fuzzy situations. The most developed of these is the 'soft' systems methodology [SSM] that adopts a radically different idea of systems ideas (Checkland, 1981; Checkland and Scholes, 1990). Exhibit 3 presents the major points of distinction between the two complementary schools of systems thinking. Soft systems thinking embodies a very different set of taken-as-given assumptions. The world is assumed to be very complex, problematical and mysterious. However, it is assumed, that our efforts at coping with it through the process of inquiry into it can itself be organised as a learning system. Thus, the use of the word system is no longer applied to the world but to the process of our dealing with the world. The critical intellectual distinction between the two fundamental forms of systems thinking is this shift of systemicity from the *world* to the *process of inquiry in to the world.* Hard systems thinking assumes that the perceived world contains "*holons*" (Koestler, 1967, 1978). A "*holon*" is an abstract notion of an entity, which is simultaneously both an autonomous whole with emergent properties, and in principle, a part of larger wholes (Checkland, 1988, pp. 235-38). Soft systems thinking assumes that the methodology or the process of inquiry can itself be created as a "*holon*" perceived. Soft systems thinking abandons the goal-seeking model of human behaviour and rejects the aim of engineering systems that will meet objectives. It is based on the fact that all real-world 'management' problem situations have at least one thing in common : they contain people interested in trying to take purposeful action (Checkland, 1972). It came with a new kind of system concept or "*holon*" called 'a human activity system', which denotes the idea of a set of activities linked together so that the whole set as an entity could pursue a purpose. For example, a human activity system, such as a professional football league is a "*holon*". It consists of a linked set of activities that include providing entertainment, providing opportunities for displays of tribal loyalty, providing vicarious conflict, enabling refinement of sporting skills, enabling police to test crowd control skills, and providing data for the betting industry. This "*holon*" could possibly be connected to another "*holon*", namely newspaper publishing that consists of interrelated activities including informing, entertaining, misinforming, providing an advertising medium, providing packaging material, and enabling the society to voice itself.

Exhibit 3 : Hard vs. Soft Systems Thinking

ATTRIBUTE	HARD SYSTEMS THINKING	SOFT SYSTEMS THINKING
• Concept of organisation	Social entities that set up and seek to achieve goals	Social entities that seek to manage relationships
• Concept of information system	An aid to decision-making in support of goals	A part of interpreting the world, sense making with respect to it, in relation to managing relationships
• Underlying systems thinking	The world is assumed to be systemic	The process of inquiry into the world is assumed to be capable of being organised as a system
• Nature of systemicity	Perceived world is systemic or holonic; the methodology or process of enquiry is a holon	The methodology or process of enquiry is systemic or holonic; human activity systems are holons

ATTRIBUTE	HARD SYSTEMS THINKING	SOFT SYSTEMS THINKING
• Process of research and inquiry	Predicated upon hypothesis testing; quantitative if possible	Predicated upon gaining insight and understanding; qualitative
• Social theory	Functionalism (stemming from Durkheim)	Interpretative (stemming from Weber)
• Philosophy	Positivism	Phenomenology

Soft Systems Methodology [SSM] : Context and Characteristics

SSM was developed over a number of years through action research and practical experience distilled from a wide range of consultancy projects that were undertaken jointly by the postgraduate Department of Systems Engineering of the University of Lancaster, and ICI, the largest company in the U. K (Checkland, 1981; Checkland and Scholes, 1990). It encapsulates the tradition of systems thinking that emerged in the 1970s and the 1980s. The two major aspects of the context of SSM's development are :

- The assumptions about the nature of the social process that underpin SSM as a whole, referred to as "appreciative systems" and
- The action research mode, requiring the involvement of the analyst in a problem situation and a readiness to use the experience itself as a research object about which lessons can be learned by conscious reflection.

The roots of the SSM concept lie in the work of Sir Geoffrey Vickers (Vickers, 1968; 1983; 1984) on the concept of "appreciation" and "appreciative systems". Vickers concluded from a lifetime of experience at the highest levels of management and policy making that "governance" is primarily concerned not with the organisation of *things* but with the maintenance of *relationships* over time, both within the organisation and with the outside world. To maintain relationships the organisation is constantly required to adapt in response to changing circumstances. Central to this adaptation is the appreciative system of the organisation, which at any moment of time has an appreciative setting, that is, the 'readiness to see and value things in one way rather than another' (Vickers, 1984, p. 160). An appreciative system exists as a number of recursive loops where the organisation exists within a constantly changing and interacting flux of events and ideas. The process of appreciation is an on-going process through which the organisation perceives some part of this flux at a point in time, making reality judgements about what is perceived and, where necessary, attempts to maintain relationships by actions (Checkland and Casar, 1986).

As such, the notion of system is only a mental construct through which we may choose to make sense of an external world. In this regard, hard systems thinking uses the concept of a system ontologically, i.e., a label for things in the real world, and analysis proceeds on the basis that the world is composed of systems and sub-systems. On the other hand, SSM emphasises that the concept of system is an epistemological device that enables *thinking about some part of the world* instead of providing an ontological *description of a part of the world.* This difference is vital in that SSM 'transfers systemicity from the world to the process of inquiry into the world' (Checkland, 1983b, p. 672). In effect, the two strands of thinking can produce quite different kinds of interventions, which is made clear by the following example about the basic role of a university.

	BELIEF ACCORDING TO SYSTEMS THINKING	NATURE OF INTERVENTION
Hard Systems Approach	'A university is a system to produce a better-qualified work force for the future.'	The belief is *definitive.* It results in activities of the institution being focused upon producing individuals equipped with managerial skills. Hence, any expenditure of resources upon activities not directly concerned with the grooming of students with such skills is seen as irrational and inefficient.
Soft Systems Approach	'A university *might be regarded* as a system to produce a better-qualified work force for the future.'	The belief is *exploratory.* It causes the investigator to examine what activities are implied, by choosing to see the university in this way. However, other possible concerns are not ruled out so that it is possible to learn and understand about real-life universities instead of passing judgements upon them in any absolute sense.

The example cited above brings to the fore some of the distinguishing characteristics (Lewis, 1994, pp. 35–40) of SSM that may be juxtaposed with hard systems thinking.

- Possibility of multiple perspectives : SSM can explain why different interpretations of a problem exist and can cope well with multiple, conflicting objectives. The de-coupling of the idea of a system from the real world enables some part of reality to be considered simultaneously as many different systems, and makes it possible to utilise discussion and debate as a means of sharing insights and achieving learning rather than mere confrontation.
- Inclusion of values and beliefs within analysis : SSM allows a situation to be regarded differently by observers with different sets of values and beliefs. The meaning of any situation is dependent upon the values, beliefs and past history of the observer. It takes differences in observers' perceptions to be an important component of the problem situation. It explicitly considers values and beliefs both through social and political analyses as well as through the *weltanschauungen* or 'declared world-views' that make any particular concept of a system meaningful. *Weltanschauungen* may be large-scale ideologies such as capitalism or they may be small-scale personally held views of good

or bad, right or wrong, desirable or otherwise, which provide a context within which behaviour can be seen to be consistent and actions can be deemed meaningful.

- **No 'right' definition of a system** : By using the concept of a system as an epistemological device together with the notion of *weltanschauungen*, SSM avoids fruitless searches for the one 'right' definition of a system or 'the solution' to a problematic situation. It accords importance to differences in motivation, norms and values—everything that makes an individual essentially human—not as possible sources of error or obstacles to achieving the correct objective knowledge of the situation. Rather, it posits that radically different views could be defended in terms of the data collected about the real world, and all could be correct in terms of a particular set of beliefs and values held by an observer. For instance, a prison may be viewed as a limited-access facility for punishing wrongdoers and criminals, so that they are transformed into useful and non-criminal members of society. Or, it may be seen as a support facility within a secure environment, secluded from the rest of society for rehabilitating socially irresponsible individuals, so as to contain criminals who would otherwise be free.
- **The nature of organisations** : SSM considers organisations to be complex and constantly changing social entities whose nature is continually redefined by those within it, by a continuous interaction of roles, norms, values and expectations. It does not see human organisations as goal-seeking mechanisms in which human beings merely carry out some necessary tasks, and which can be engineered using the same methods and techniques as used in the engineering of physical artefacts.
- **Nature of intervention** : SSM views the arrival of the analyst as changing the problem solution, and hence, considers the nature of the intervention itself as something that must be carefully considered and managed. Moreover, politics is not regarded as an aspect of the situation, which interferes with rational analysis as confusing "noise", but as a very vital part ot the situation. This makes negotiation and debate necessary for the analyst and those in the situation to reach an agreement or at least an accommodation regarding the nature of the present situation, what is problematical, what might constitute a solution, and what role the analyst might play. Thus, SSM requires the analyst to address the second level of analysis that takes place in any intervention, namely, the nature of the intervention process itself. Assumptions concerning who is the "client", who "owns" the problem, and what role must the analyst "act" in a particular problem situation are subjects for examination and debate.
- **Human activity systems** : In SSM, the special ability of human beings to attribute meaning to observations of the world and to demonstrate purposeful behaviour, is recognised by the idea of human activity systems as a special class of systems that are distinct from other classes of designed physical systems. It must be noted, however, that this concept is an epistemological device of SSM, i.e., its use is intended to lead to insights if we choose to regard

some part of the real world in which human beings play a major role, as a human activity system.

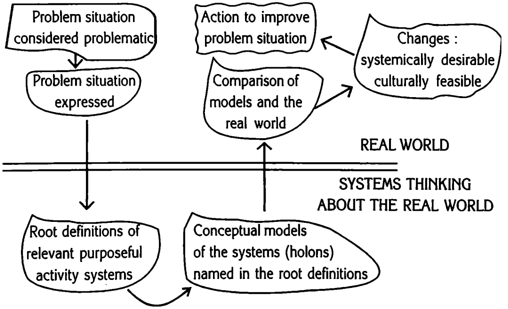
- **An approach to learning rather than problem solving :** SSM uses systems ideas as a means of inquiry, and is based on a paradigm of learning rather than of optimisation. Organisational learning is seen as a valid end result for an intervention with tangible changes to the situation. Thus, even though SSM results in changes to the situation, the end result may sometimes be, not a problem now solved, but, a change in perceptions about the situation. A study may end "successfully" with those initially seeing a situation as problematical no longer viewing it as such.
- **Underlying philosophy :** SSM causes the underlying philosophy of systems theory to shift from positivism towards phenomenology. It argues that a fundamentally different approach is necessary in studying human organisations from that which we might use to study the natural world (scientific method) or designed physical systems (hard systems thinking). This is because of the special nature of human beings. They have consciousness and free will; they do not simply react to the world, in which they live but are able to interpret and attribute meanings upon their sensations of the world. So, to understand the actions of human beings, it is necessary to investigate those meanings and the values and perceptions that give rise to them.

SSM as an Inquiring / Learning Process

The short excursion into systems thinking in the previous sections lead us to conclude that the practice of systems thinking causes one to set some constructed abstract wholes (often called "systems models") against the perceived real world in order to learn about it. The purpose of doing it may range from engineering some part of the world perceived as a system to seeking insight or illumination. Within systems thinking, there are two complementary traditions. The "hard" tradition takes the world to be systematic, whilst the "soft" tradition creates the process of inquiry as a system.

As such, SSM is a systemic process of inquiry, which also happens to make use of systems models. It thus subsumes the "hard" approach, which is a special case of it arising when there is local agreement on some system to be engineered. As an enquiring process it has two streams of inquiry : logic-based and cultural. The original formulation of SSM (Checkland, 1975) is presented as a seven-stage model (Exhibit 4). Steps 1 and 2 are usually combined to create a "rich picture" of what is happening and how people see it. This is produced preferably in a pictorial form, which enhances the idea of what we see is going on. Once the basic picture is there, further levels of "richness" can be added to the picture. From the rich picture (the richer the better) it is possible in Step 3 to define a "root definition" based on the participant's perceptions of what the system does and why it does it, and what is wanted from it. The root definition must cover six elements : the clients of the system; the actors or doers; desired transformation; a holistic "world" view; the owners of the system; and the environment in which the system operates. Step 4 is concerned with converting the root definitions into a series of "conceptual models" that define how the system functions and how it achieves its aims. These models are usually prepared using active words to describe what is happening within the system. Here again, it is useful to create the models in a pictorial/flowchart form so that interlinked activities can be shown. Step 5 calls for comparison of conceptual models with the real world. This will reveal where problems/deficiencies exist between the actual (the rich picture) and the desirable (the root definition) in the models. This obviously leads to Step 6 where feasible/desirable changes are defined. These are based partly on correcting the deficiencies and partly on resolving problems. The changes should cover all aspects of the system being analysed and the viewpoints of all the participants. A schedule of desired changes can then be produced and priorities attached to them. Preparing a simple grid may conveniently compare the priorities of each group of participants, which are usually different but often reveal some degree of overlap. Finally, Step 7 deals with taking action to improve. This should be a simple process of following the schedule of changes according to the agreed priority, and then implementing them. However, we might encounter the well-known phenomenon of resistance to change. This is where people who have agreed to what needs to be done start to prevaricate when they have to come around to doing it. It must be noted that SSM does not provide any magic formula for implementing change. As in the hard systems approach, the secret of effective implementation of change does not lie in the methodology but within the human relationships and the willingness of the involved people to change. It should be made clear that change management is not a prescribed part of SSM; rather, change management is a complete subject in its own right involving many aspects of human development. Nevertheless, SSM can aid the change management efforts by requiring the involvement of all the people concerned with the system from the very beginning of the review process.

Exhibit 4 : The Seven-stage Model of SSM


Problem situation considered problematic
Problem situation expressed
Action to improve problem situation
Changes : systemically desirable culturally feasible
Comparison of models and the real world
REAL WORLD
SYSTEMS THINKING ABOUT THE REAL WORLD
Root definitions of relevant purposeful activity systems
Conceptual models of the systems (holons) named in the root definitions

A significant feature of this early formulation of the SSM model is the dividing line, which separates the "systems thinking world" below the line from the everday "real world" of the problem situation above the line. It highlights the methodology's dual research strategy. It combines ontological and epistemological positions : its postulation of a below-the-line "systems thinking world", is apparently unitary and the same for all observers, and thus seems to assume an objectivist ontology. However, Checkland (1981) has all along distinguished his stance from that of the natural sciences by stressing that 'human beings can always attach different meanings to the same social world'. According to him, 'human beings are not simply ready to attribute meanings, they cannot abide meaningless'. They abide an interpreted, not merely an experienced world (Checkland and Scholes, 1990). The "real world" is associated with the unfolding flux of events and ideas, while the central position in SSM of *"Weltanschauung"* or large-scale world-views governing a set of beliefs that validates the transformation of a holon, seeks to predicate an interpreted or socially constructed view of reality. The methodological device of developing "relevant systems" to enable different 'analyst' interpretations of, or conjectures about aspects of the problem situation, is also consistent with an interpretative stance (Rose, 1997, p. 251). Thus, Checkland's notion of the "real world" must be taken to be a socially constructed world in which 'participants continually negotiate and renegotiate with others, their perceptions and interpretations of the world outside themselves' (Checkland, 1986). Since the SSM analyst is also a participant in that process of perception and interpretation of the world, we should take the "real world" of the seven-stage model to mean a prior, or non-conceptualised perception of the problem domain. Checkland refers to the "real world" as the 'unreflecting involvement in the everyday world' and the "systems thinking" as the epistemological set of principles, which allow us to arrive at a richer understanding, and therefore altered (richer and more insightful) perceptions of that domain (Checkland and Scholes, 1990). Furthermore, Checkland has acknowledged that the meaning of the dividing line between the "real world" and the "systems thinking world" of the seven-stage model is 'heuristic rather than theory-based' (Tsouvalis and Checkland, 1996). The line of separation was intended to draw attention to the conscious use of systems language in developing the intellectual devices that are consciously used to structure debate (Checkland, 1989, p. 12). It was subsequently eliminated from the 1990 version of the SSM model.

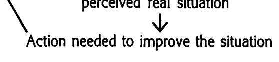
The seven-stage model of SSM has proved to be resilient because it is easy to understand and teach as a sequence that unfolds logically. Secondly, the SSM model happily incorporates seven stages, which is very appropriate and attuned to the channel capacity of our brains. Miller (1956), by virtue of a series of laboratory experiments on perception suggests that we can comfortably cope with about seven concepts at a time. Thus, the comfortable size of the SSM process model means that we can easily retain it in our mind, which can prove to be very useful when using it flexibly in practice. Moreover, it has an intangible aesthetic point that is very important. Its fried-egg shapes and curved arrows undermine the apparent certainty conveyed by straight arrows and rectangular boxes typical of work in science and engineering. The organic style and the hand drawn "rich pictures" conveys the status of these artefacts as working models, currently relevant now in this study, and not claiming permanent ontological status. They are also meant to look more human, more natural than the lines and right angles of hard systems approaches.

SSM has, over the last two decades, emerged as a learning system since it 'aims to bring about improvements in areas of social concern by activating in the people involved in the situation a learning cycle which ideally is never ending' (von Bulow, 1989). In principle, the learning may go on and on, and to end a systems study is really having to take an arbitrary step because problematical situations (including all human situations) will continue to evolve, and will never be free from differences of interest, opinion and values. Practice of SSM by those who had internalised it revealed that the seven-stage model was rather bald and unable to capture the more flexible use of SSM. The model was revised and presented as a four-activities model (Checkland and Scholes, 1990, pp 6-7). It is iconic rather than descriptive in terms of the four activities that are implied rather than declared.

Furthermore, it subsumes two streams of analysis within the four activities. The activation of the learning cycle in SSM in its recent version is achieved through a combination of two streams of analysis. One is a *logic-based stream* via activity models (as formulated in the seven stage model); the other is a *cultural/political stream* enabling judgements to be made about the accommodations between conflicting interests that might be reachable by the people concerned, and which would enable action. The dual stream of analysis recognises the crucial role of history in human affairs. It is their history that determines, for a given group of people, what will be noticed as significant, and how what is noticed will be judged. The iconic model of SSM delineates the following four activities (Exhibit 5) :

1) Finding out about a problem situation, logically as well as culturally/politically.
2) Formulating some relevant purposeful activity models.
3) Debating the situation using the models, and seeking from the debate both
    - *i.* changes which would improve the situation and are regarded as both desirable and culturally feasible, and
    - *ii.* the accommodation between conflicting interests, which will enable action-to-improve to be taken.
4) Taking action in the situation to bring about the improvement.

Exhibit 5 : The Enquiring-Learning Process of SSM


Yields choices of
A real world situation of concern
Relevant systems of purposeful activity
Comparison of models with perceived real situation
Action needed to improve the situation

SSM Epistemology : The Language through which the Process Works

In SSM, inquiry into a real-world situation in which people are trying to take purposeful action is structured by setting the perceived situation against a number of purposeful *"holons"* or 'human activity systems' (Checkland, 1988), as pointed out earlier. These purposeful *"holons"* are defined and modelled in a way that they can provide a source of questions to be asked of the problem situation. Answering these questions helps understand the situation and leads to the emergence of a structured and coherent debate about intended change (Checkland and Tsouvalis, 1996, p. 153). The process of SSM can well be seen as a formalised and organic version of the process of purposeful thinking that is undertaken by human beings in everyday affairs. This process includes the following series of activities : *Perceive* problem situations → *select* a subject → *predicate* the subject by asserting or thinking something about it → *compare* altemative predicates with one another or with perceived reality, or both → *formulate arguments* in relation to evidence which form the basis for our *decisions to act* in particular ways → *decide* action. SSM articulates this kind of serious and organised thinking familiar to us from our everyday affairs, in its methodology for enquiring into complex problem situations. The articulation makes use of some basic systems ideas that are enshrined in a language through which the SSM process makes sense. The SSM epistemology is summarised in Exhibit 6.

Exhibit 7 : SSM Epistemology

TERMINOLOGY	INTERPRETATION
I. Real world	The unfolding interacting flux of events and ideas experienced as everyday life.
II. Systems thinking world	The world in which conscious reflection on the 'real world' using systems ideas takes place.
III. Problem situation	A real-world situation in which there is a sense of unease, a feeling that things could be better than they are, or some perceived problem requiring attention.
IV. Analysis One	Examination of the intervention or interaction in terms of roles : 'client' (causes the study to take place), 'problem-solver' (undertakes the inquiry) and 'problem owner' (plausible roles from which the situation may be viewed as chosen by problem solver).
Two	Examination of the social and cultural characteristics of the problem situation via interacting roles (social positions), norms (expected behaviour in roles) and values (by which role-holders are judged).
Three	Examination of the power-related (political aspects) of the problem situation.
V. Rich pictures	Pictorial / diagrammatic representations of the situation's entities (structures), processes, relationships and issues.

TERMINOLOGY	INTERPRETATION
VI. Root definitions	Concise verbal definitions expressing the nature of purposeful activity systems regarded as relevant to exploring the problem situation, e.g., do X by Y to achieve Z.
VII. CATWOE	The 6 elements considered in formulating root definitions. 'C' (customers) implies victims or beneficiaries of 'T'. 'A' (actors) are those who carry out the activities in 'T'. 'T' (transformation) is the process of conversion of some entity (input) into a changed form of the entity (output), and is at the core of the methodology. 'W' *(Weltanschauung)* is a world-view, which makes 'T' meaningful in context. 'O' (owner) is the person or group who could stop 'T' and abolish the system. 'E' (environmental constraints) are factors the system takes as given.
VIII. The 5-Es	'T' would be judged by 5 criteria : • Efficacy : Does the means work ? • Efficiency : Are minimum resources used ? • Effectiveness : Does the 'T' help attainment of longer term goals related to 'O' expectations ? • Ethicality : Is T a moral thing to do ? • Elegance : Is T aesthetically pleasing ?
IX. Conceptual model	The structured set of activities necessary to realise the root definition and CATWOE, consisting of an operational sub-system and a monitoring and control sub-system based on the 5-Es.
X. Comparison	Setting the conceptual models against the perceived "real world" in order to generate debate about perceptions of it, and changes to it which would be regarded as beneficial.
XI. Desirable and feasible changes	Possible changes which are systemically desirable on the basis of the learned relevance of the relevant systems, and culturally feasible for the people in the situation at this time.
XII. Action	Real-world action as opposed to activity in conceptual models, to improve the problem situation as a result of operation of the learning cycle for which this epistemology provides a language.
XIII. The system to use SSM	The language and structure of SSM provides an epistemology, which makes sense of the process of using SSM.

Application of SSM in Real-world Contexts

Checkland and Scholes (1990) presented the findings of their attempts to apply SSM in ten different studies they believe 'are representative of a larger set of experiences using SSM, which the authors have accumulated in the last decade'. The studies include :

- Information and Library Services (ILSD) in ICI Organics : The study led to a new conceptualisation of ILSD, and helped persuade the company to devote new resources to it.
- Community Medicine Department in the National Health Service : The study provided a way of evaluating any health care project.
- Central Computer and Telecommunication Agency (CCTA) : The study contributed to the rethinking of the central role of this Government Agency.
- ICL, the largest supplier of computers in the U. K. : The study covered a wide range of different engagements with problem situations of various kinds. Obviously, the outcomes of the study were many and various, but they all contributed to the coherent enactment of the company's appreciative system. In the main, it led to structures for programmes of work, contributions to decisions about what ICL should do and how it should organise itself, and new ways of conceptualising parts of the company and its activities.
- Manufacturing function in Shell Group : The study resulted in a new structure for the manufacturing function with new processes for running it, and the establishment of a concept of core purposes, structure and processes relating to the function from which the required strategy for creating its appropriate information systems was defined and implemented.

Conclusion : Revisiting SSM as a Research Tool

The paper has tried to establish SSM as a necessary complement to the hard systems approaches of systems engineering, systems analysis and classical OR as a field of inquiry. SSM is an organised use of systems ideas in a methodology for learning one's way to purposeful action to improve a problem situation (Checkland and Scholes, 1990, p. 284). The most noteworthy feature about SSM is that it is methodology (the *logos* of method or the principles of method) rather than technique or method. Thus, it can never be independent of its user, as is technique. It is SSM's status of a methodology that has caused Naughton (1977) to raise an interesting substantive question about it : How can we know that what someone may claim to be a use of SSM is legitimately so described ? He suggested that there were some "Constitutive Rules" to be obeyed if one is to be carrying out an enquiry, and some "Strategic Rules" that are more personal and help the user to make choices from among the basic rules. The Constitutive Rules underlying SSM (Checkland and Scholes, 1990, p. 286-7) that have emerged from the varied experiences with the methodology are as follows :

1. SSM is a structured way of thinking, which focuses on some real-world situation perceived as problematical. The aim is always to bring about perceived

improvements in the situation, irrespective of whether the work is undertaken as part of normal day-to-day managerial work or as a special highlighted study.

2. SSM's structured thinking is based on systems ideas and its whole process yields an explicit epistemology. Any work that claims to being SSM-based must be capable of being expressed in terms of this epistemology.
3. The claim to the use of SSM should refer to instances in which the following guidelines were followed :
    - There is no automatic assumption that the real world is systemic.
    - Careful distinction is made between unreflecting involvement in the everyday world and conscious systems thinking about the real world. The SSM user is always conscious of moving from one world to the other, and will do so many times in using the approach.
    - *Holons* are constructed in the systems thinking phases. These take the form of purposeful "human activity systems" embodying the basic ideas of emergent properties, layered structure, processes of communication, and control.
    - The *holons* are used to inquire into, or interrogate the real world in order to articulate a dialogue or debate aimed at defining changes that are desirable and feasible.
4. SSM can be used in many different ways in different situations, and will be interpreted differently by each user. Therefore, any potential use of it ought to be characterised by conscious thought about how to adapt it to a particular situation.
5. Since SSM is methodology and not technique, every use of it will potentially yield methodological lessons in addition to those about the situation of concern. The methodological lessons may be about SSM's framework of ideas, or its processes, or the way it was used, or all of these.

To sum up, we may affirm that SSM is a favourable methodological device for adding clarity and transparency to the "fuzzy" realm of ethical issues. Hence, it may be seen as an imperative for the rapid development of business ethics as an intellectual field and as a vast, rich and unexplored terrain of social science research. SSM may be meaningfully integrated into any business ethics research programme alongside other methods of enquiry to serve as (Rose, 1997, p. 257) :

1. A problem-structuring tool for lending structure to soft and "messy" problems.
2. A good-fit research tool that is qualitative, activity-based, interpretative, participative, systems-based, and methodologically explicit.
3. A triangular tool through which findings obtained with other methods may be confirmed, refuted or amplified.
4. A theory-generation and testing tool with a defensible ontology, epistemology and reasoning strategy.
5. A coordinative or directive tool where the research processes may be conceptualised as purposeful "human activity systems".

However, one caveat about SSM research is that its success and acceptance is contingent on the attitudes of the major research stakeholders—researchers (those who do the research), research sponsors (those who are being researched), and research audience (those whose acceptance of the research make it meaningful. Where important stakeholders differ fundamentally in their ontological, epistemological and reasoning strategy stances from those of SSM, success and acceptance is unlikely (Rose, 1997, p. 256).

As a befitting last word about the efficacy and future applicability of SSM in the realm of business ethics research Laszlo's observation (1972, p. 120) appears very apt :

> "The supreme challenge of our age is to specify, and *learn to respect,* the objective norms of existence within the complex and delicately balanced hierarchic order that is both in us and around us. For there is no other way to make sure that we achieve a culture that is viable and humanistic.
>
> The natural philosophy of the new developments in the sciences is a systems philosophy. When properly articulated it can give us both factual and normative knowledge. Exploring such knowledge and applying it in determining our future is an opportunity we cannot afford afford to miss".

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